SBML Model Report

Model name: "Smallbone2013 - E.coli metabolic model with modular rate law"

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1 General Overview

This is a document in SBML Level 2 Version 4 format. This model was created by the following three authors: Nick Juty[1], Vijayalakshmi Chelliah[2] and Kieran Smallbone[3] at November 22nd 2011 at no o' clock in the morning. and last time modified at November fifth 2013 at 10:10 a. m. Table 1 gives an overview of the quantities of all components of this model.

Table 1: Number of components in this model, which are described in the following sections.

Element	Quantity	Element	Quantity
compartment types	0	compartments	2
species types	0	species	786
events	0	constraints	0
reactions	399	function definitions	1
global parameters	0	unit definitions	7
rules	0	initial assignments	0

2 Unit Definitions

This is an overview of eleven unit definitions of which four are predefined by SBML and not mentioned in the model.

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2.1 Unit substance

Name mmol

Definition mmol

2.2 Unit mM

Name mM

Definition $\mathrm{mmol} \cdot \mathrm{l}^{-1}$

2.3 Unit mM_per_s

Name mM per s

Definition $\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$

2.4 Unit mM_squared

Name mM squared

Definition $\mathrm{mmol}^{2} \cdot \mathrm{l}^{-2}$

2.5 Unit mM_fourth

Name mM fourth

Definition $\mathrm{mmol}^{4} \cdot \mathrm{l}^{-4}$

2.6 Unit per_mM

Name per mM

Definition $\mathrm{mmol}^{-1} \cdot \mathrm{l}$

2.7 Unit per_mM_squared

Name per mM squared

Definition $\mathrm{mmol}^{-2} \cdot \mathrm{l}^{2}$

2.8 Unit volume

Notes Litre is the predefined SBML unit for `volume`.

Definition l

2.9 Unit area

Notes Square metre is the predefined SBML unit for area since SBML Level 2 Version 1.

Definition m^2

2.10 Unit length

Notes Metre is the predefined SBML unit for length since SBML Level 2 Version 1.

Definition m

2.11 Unit time

Notes Second is the predefined SBML unit for time.

Definition s

3 Compartments

This model contains two compartments.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
cell	cell	0000290	3	1	litre	☑	
extracellular	extracellular	0000290	3	1	litre	☑	

3.1 Compartment cell

This is a three dimensional compartment with a constant size of one litre.

Name cell

SBO:0000290 physical compartment

3.2 Compartment extracellular

This is a three dimensional compartment with a constant size of one litre.

Name extracellular

SBO:0000290 physical compartment

4 Species

This model contains 786 species. The boundary condition of 384 of these species is set to `true` so that these species' amount cannot be changed by any reaction. Section 7 provides further details and the derived rates of change of each species.

Table 3: Properties of each species.

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0029	(R)-Glycerate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0032	(R)-Pantoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0033	(R)-Pantothenate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0041	(S)-2-Aceto-2-hydroxybutanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0042	(S)-2-Acetolactate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0043	(S)-3-Hydroxybutanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0044	(S)-3-Hydroxydecanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0045	(S)-3-Hydroxydodecanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0047	(S)-3-Hydroxyhexanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0049	(S)-3-Hydroxyoctanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0051	(S)-3-Methyl-2-oxopentanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0052	(S)-Dihydroorotate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0098	1-(5-Phosphoribosyl)-AMP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0099	1-(5-Phosphoribosyl)-ATP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0116	1-deoxy-D-xylulose 5-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0128	1-Pyrroline-5-carboxylate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0133	10-Formyltetrahydrofolate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0148	2,3,4,5-Tetrahydrodipicolinate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0155	2,3-Dihydrodipicolinate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0194	2-C-methyl-D-erythritol 4-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0203	2-Dehydropantoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0214	2-Hydroxy-3-oxopropanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0217	2-Isopropylmaleate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0226	2-Octaprenyl-6-hydroxyphenol	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0229	2-Octaprenylphenol	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0232	2-Oxobutanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0233	2-Oxoglutarate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0252	3'-Phosphoadenylyl sulfate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0255	3,4-dihydroxy-2-butanone 4-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0262	3-(4-Hydroxyphenyl)pyruvate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0269	3-Dehydroquinate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0270	3-Dehydroshikimate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0271	3-Deoxy-D-manno-2-octulosonate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0282	3-Methyl-2-oxobutanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0283	3-Octaprenyl-4-hydroxybenzoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0293	3-Oxodecanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0295	3-Oxododecanoyl-CoA	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0297	3-Oxohexadecanoyl-CoA	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0299	3-Oxohexanoyl-CoA	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0303	3-Oxooctanoyl-CoA	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0305	3-Oxotetradecanoyl-CoA	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0306	3-Phospho-D-glycerate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0307	3-Phospho-D-glyceroyl phosphate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0308	3-Phosphohydroxypyruvate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0310	4,5-dihydroxy-2,3-pentanedione	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0316	4-amino-4-deoxychorismate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0318	4-Aminobenzoate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0325	4-Hydroxybenzoate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0328	4-Methyl-2-oxopentanoate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0331	4-Phospho-D-erythronate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0332	4-Phospho-L-aspartate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0333	5'-Deoxyadenosine	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0334	5'-deoxyribose	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0335	5,10-Methenyltetrahydrofolate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0336	5,10-Methylenetetrahydrofolate	cell	$mmol \cdot l^{-1}$	⊟	⊟
s_0337	5,6,7,8-Tetrahydrofolate	cell	$mmol \cdot l^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxamide	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0345	5-Amino-4-oxopentanoate	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0354	5-Methyltetrahydrofolate	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0361	5-Phospho-beta-D-ribosylamine	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0367	6-hydroxymethyl dihydropterin	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟
s_0368	6-hydroxymethyl-dihydropterin pyrophosphate	cell	$\mathrm{mmol} \cdot 1^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0369	6-Phospho-D-gluconate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0370	6-phospho-D-glucono-1,5-lactone	cell	$mmol \cdot l^{-1}$	☐	☐
s_0371	7,8-Diaminononanoate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0372	7,8-Dihydrofolate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0376	8-Amino-7-oxononanoate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	cell	$mmol \cdot l^{-1}$	☐	☐
s_0378	[2Fe-2S] iron-sulfur cluster	cell	$mmol \cdot l^{-1}$	☐	☐
s_0380	[4Fe-4S] iron-sulfur cluster	cell	$mmol \cdot l^{-1}$	☐	☐
s_0381	Acetaldehyde	cell	$mmol \cdot l^{-1}$	☐	☐
s_0384	Acetate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0391	Acetoacetyl-CoA	cell	$mmol \cdot l^{-1}$	☐	☐
s_0393	Acetyl phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0395	Acetyl-CoA	cell	$mmol \cdot l^{-1}$	☐	☐
s_0397	acyl carrier protein	cell	$mmol \cdot l^{-1}$	☐	☐
s_0405	Adenine	cell	$mmol \cdot l^{-1}$	☐	☐
s_0408	Adenosine	cell	$mmol \cdot l^{-1}$	☐	☐
s_0411	Adenosine 3',5'-bisphosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0412	Adenosine 5'-phosphosulfate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0420	adenylated molybdopterin	cell	$mmol \cdot l^{-1}$	☐	☐
s_0421	ADP	cell	$mmol \cdot l^{-1}$	☐	☐
s_0435	all-trans-Octaprenyl diphosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0445	alpha-D-Ribose 1-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0446	alpha-D-Ribose 5-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0451	Ammonium	cell	$mmol \cdot l^{-1}$	☐	☐
s_0453	Ammonium	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_0454	AMP	cell	$mmol \cdot l^{-1}$	☐	☐
s_0457	Anthranilate	cell	$mmol \cdot l^{-1}$	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0467	ATP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0470	beta-Alanine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0474	Bicarbonate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0476	Biotin	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0479	bis-molybdenum cofactor	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0480	bis-molybdopterin guanine dinucleotide	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0481	bis-molybdopterin mono-guanine dinucleotide	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0488	Butanoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0497	Calcium	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0499	Calcium	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_0502	Carbamoyl phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0510	CDP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0513	CDP-1,2-dihexadecanoylglycerol	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0520	Chloride	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0522	Chloride	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_0526	chorismate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0530	cis-Aconitate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0536	Citrate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0539	CMP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0542	CMP-3-deoxy-D-manno-octulosonate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0543	CO2	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0545	CO2	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0546	Co2+	cell	$mmol \cdot l^{-1}$	☐	☐
s_0548	Co2+	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_0555	Coenzyme A	cell	$mmol \cdot l^{-1}$	☐	☐
s_0565	Coproporphyrinogen III	cell	$mmol \cdot l^{-1}$	☐	☐
s_0574	Crotonoyl-CoA	cell	$mmol \cdot l^{-1}$	☐	☐
s_0575	CTP	cell	$mmol \cdot l^{-1}$	☐	☐
s_0579	Cu2+	cell	$mmol \cdot l^{-1}$	☐	☐
s_0581	Cu2+	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_0585	cyclic pyranopterin monophosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0599	D-4'-Phosphopantothenate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0600	D-Alanine	cell	$mmol \cdot l^{-1}$	☐	☐
s_0603	D-Alanyl-D-alanine	cell	$mmol \cdot l^{-1}$	☐	☐
s_0611	D-Arabinose 5-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0621	D-Erythrose 4-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0622	D-Fructose	cell	$mmol \cdot l^{-1}$	☐	☐
s_0627	D-Fructose 6-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0653	D-Glucosamine 1-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0654	D-Glucosamine 6-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0657	D-Glucose	cell	$mmol \cdot l^{-1}$	☐	☐
s_0659	D-Glucose	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_0663	D-Glucose 6-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0671	D-Glutamate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0675	D-Glycerate 2-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0704	D-Ribulose 5-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_0721	D-Xylulose 5-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0726	dATP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0731	dCTP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0732	Deamino-NAD+	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0737	Decanoyl-CoA (n-C10:0CoA)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0738	dehydroglycine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0754	Dephospho-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0755	Dethiobiotin	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0760	dGTP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0765	Dihydroneopterin	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0766	Dihydroneopterin monophosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0767	Dihydropteroate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0768	dihydrosirohydrochlorin	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0772	Dihydroxyacetone phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0779	Dimethylallyl diphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0783	Diphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0785	Dodecanoate (n-C12:0)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0795	dTDP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0802	dTMP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0805	dTTP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0807	dUMP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0810	dUTP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0826	Farnesyl diphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0838	Fe2+	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0840	Fe2+	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_0841	Fe3+	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0843	Fe3+	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_0859	Flavin adenine dinucleotide oxidized	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0860	Flavin adenine dinucleotide reduced	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0861	Flavodoxin reduced	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0862	flavodoxin semi oxidized	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0863	FMN	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0867	Formate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0875	Fumarate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0896	GDP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0903	Geranyl diphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0910	Glutaryl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0913	Glyceraldehyde 3-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0920	Glycerol 3-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0929	Glycine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0936	Glycolaldehyde	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0937	Glycolate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0941	Glyoxylate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0942	GMP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0945	GTP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0971	Hexadecanoate (n-C16:0)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0976	Hexadecenoate (n-C16:1)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0984	Hexanoyl-CoA (n-C6:0CoA)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0991	Hydrogen peroxide	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0994	Hydrogen sulfide	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_0998	Hydroxymethylbilane	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1005	Iminoaspartate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1006	IMP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1009	Indole	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1017	IscS sulfur acceptor protein	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1018	IscS with bound sulfur	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1019	IscU scaffold protein	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1020	IscU with bound [2Fe-2S] cluster	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1021	IscU with bound [4Fe-4S] cluster	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1022	IscU with two bound [2Fe-2S] clusters	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1027	Isocitrate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1028	Isopentenyl diphosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1033	KDO(2)-lipid IV(A)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1038	KDO-lipid IV(A)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1040	L-2-Amino-3-oxobutanoate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1041	L-Alanine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1061	L-Arginine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1068	L-Asparagine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1072	L-Aspartate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1075	L-Aspartate 4-semialdehyde	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1081	L-Citrulline	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1082	L-Cystathionine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1083	L-Cysteine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1095	L-Glutamate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1098	L-Glutamate 1-semialdehyde	cell	$mmol \cdot l^{-1}$	☐	☐
s_1099	L-Glutamate 5-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1100	L-Glutamate 5-semialdehyde	cell	$mmol \cdot l^{-1}$	☐	☐
s_1101	L-Glutamine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1105	L-Glutamyl-tRNA(Glu)	cell	$mmol \cdot l^{-1}$	☐	☐
s_1106	L-Histidine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1109	L-Histidinol	cell	$mmol \cdot l^{-1}$	☐	☐
s_1110	L-Histidinol phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1112	L-Homocysteine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1113	L-Homoserine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1119	L-Isoleucine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1127	L-Leucine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1131	L-Lysine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1138	L-Malate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1141	L-Methionine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1151	L-Phenylalanine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1155	L-Proline	cell	$mmol \cdot l^{-1}$	☐	☐
s_1170	L-Serine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1179	L-Threonine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1185	L-Tryptophan	cell	$mmol \cdot l^{-1}$	☐	☐
s_1189	L-Tyrosine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1193	L-Valine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1204	Lipid A Disaccharide	cell	$mmol \cdot l^{-1}$	☐	☐
s_1211	LL-2,6-Diaminoheptanedioate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1212	magnesium	cell	$mmol \cdot l^{-1}$	☐	☐
s_1214	magnesium	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_1216	Malonyl-[acyl-carrier protein]	cell	$mmol \cdot l^{-1}$	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1217	Malonyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1218	malonyl-CoA methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1239	Menaquinol 8	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1240	Menaquinone 8	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1242	meso-2,6-Diaminoheptanedioate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1248	Methanol	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1250	Methanol	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_1255	Mn2+	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1257	Mn2+	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_1258	MoaD Protein with bound AMP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1259	MoaD Protein with carboxylate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1260	MoaD Protein with thiocarboxylate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1261	Molybdate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1263	Molybdate	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_1264	molybdenum cofactor	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1265	molybdopterin	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1274	N(omega)-(L-Arginino)succinate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1277	N-((R)-4-Phosphopantothenoyl)-L-cysteine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1287	N-Acetyl-D-glucosamine 1-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1302	N-Acetyl-L-glutamate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1304	N-Acetyl-L-glutamyl 5-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1312	N-Carbamoyl-L-aspartate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	cell	$mmol \cdot l^{-1}$	☐	☐
s_1321	N2-Acetyl-L-ornithine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	cell	$mmol \cdot l^{-1}$	☐	☐
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	cell	$mmol \cdot l^{-1}$	☐	☐
s_1329	nickel	cell	$mmol \cdot l^{-1}$	☐	☐
s_1331	nickel	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_1333	Nicotinamide adenine dinucleotide	cell	$mmol \cdot l^{-1}$	☐	☐
s_1334	Nicotinamide adenine dinucleotide - reduced	cell	$mmol \cdot l^{-1}$	☐	☐
s_1335	Nicotinamide adenine dinucleotide phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	cell	$mmol \cdot l^{-1}$	☐	☐
s_1340	Nicotinate D-ribonucleotide	cell	$mmol \cdot l^{-1}$	☐	☐
s_1358	O-Acetyl-L-serine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1362	O-Phospho-4-hydroxy-L-threonine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1363	O-Phospho-L-homoserine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1364	O-Phospho-L-serine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1367	O-Succinyl-L-homoserine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1372	O2	cell	$mmol \cdot l^{-1}$	☐	☐
s_1374	O2	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_1390	Octanoyl-CoA (n-C8:0CoA)	cell	$mmol \cdot l^{-1}$	☐	☐
s_1391	Ornithine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1394	Orotate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1397	Orotidine 5'-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1399	Oxaloacetate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1406	Oxidized thioredoxin	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1407	p-Cresol	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1411	Palmitoyl-ACP (n-C16:0ACP)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1412	Palmitoyl-CoA (n-C16:0CoA)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1413	Pantetheine 4'-phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1429	Phenylpyruvate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1430	Phosphate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1432	Phosphate	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1484	Phosphoenolpyruvate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1491	Pimeloyl-[acyl-carrier protein]	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1493	Porphobilinogen	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1494	potassium	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1496	potassium	extracellular	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
s_1497	Prephenate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1508	Protoheme	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐
s_1511	Protoporphyrin	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1512	Protoporphyrinogen IX	cell	$mmol \cdot l^{-1}$	☐	☐
s_1522	Pyridoxal 5'-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1530	Pyridoxine 5'-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1531	Pyruvate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1537	Quinolinate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1544	Reduced thioredoxin	cell	$mmol \cdot l^{-1}$	☐	☐
s_1546	Riboflavin	cell	$mmol \cdot l^{-1}$	☐	☐
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1551	S-Adenosyl-L-homocysteine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1552	S-Adenosyl-L-methionine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1558	S-Ribosyl-L-homocysteine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1561	Sedoheptulose 7-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1571	Shikimate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1574	Shikimate 5-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1577	Siroheme	cell	$mmol \cdot l^{-1}$	☐	☐
s_1578	sirohydrochlorin	cell	$mmol \cdot l^{-1}$	☐	☐
s_1595	Succinate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1599	Succinyl-CoA	cell	$mmol \cdot l^{-1}$	☐	☐
s_1609	Sulfate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1611	Sulfate	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_1612	Sulfite	cell	$mmol \cdot l^{-1}$	☐	☐
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	cell	$mmol \cdot l^{-1}$	☐	☐
s_1643	Thiamin monophosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1644	Thiamine diphosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1668	trans-Dec-2-enoyl-CoA	cell	$mmol \cdot l^{-1}$	☐	☐
s_1670	trans-Dodec-2-enoyl-CoA	cell	$mmol \cdot l^{-1}$	☐	☐
s_1672	trans-Hex-2-enoyl-CoA	cell	$mmol \cdot l^{-1}$	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1674	trans-Hexadec-2-enoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1676	trans-Oct-2-enoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1680	trans-Tetradec-2-enoyl-CoA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1690	tRNA (Glu)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of chain)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1725	two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1731	Ubiquinol-8	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1732	Ubiquinone-8	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1733	UDP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1745	UDP-N-acetyl-D-glucosamine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1750	UDP-N-acetylmuramate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1751	UDP-N-acetylmuramoyl-L-alanine	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1762	UMP	cell	$mmol \cdot l^{-1}$	☐	☐
s_1765	Undecaprenyl diphosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1768	Undecaprenyl phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopimeloyl-D-ala-D-ala	cell	$mmol \cdot l^{-1}$	☐	☐
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	cell	$mmol \cdot l^{-1}$	☐	☐
s_1791	Uroporphyrinogen III	cell	$mmol \cdot l^{-1}$	☐	☐
s_1792	UTP	cell	$mmol \cdot l^{-1}$	☐	☐
s_1799	Xanthosine 5'-phosphate	cell	$mmol \cdot l^{-1}$	☐	☐
s_1804	Zinc	cell	$mmol \cdot l^{-1}$	☐	☐
s_1806	Zinc	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_1807	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_1835	5'-deoxyribose	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_2072	p-Cresol	extracellular	$mmol \cdot l^{-1}$	☑	☑
s_2093	S-Adenosyl-4-methylthio-2-oxobutanoate	extracellular	$mmol \cdot l^{-1}$	☑	☑
e_0001	thrA	cell	$mmol \cdot l^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0002	thrB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0003	thrC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0005	talB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0006	mog	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0008	ribF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0010	ispH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0012	dapB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0020	folA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0022	pdxA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0030	leuD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0031	leuC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0032	leuB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0033	leuA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0034	ilvI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0035	ilvH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0036	ftsI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0037	murE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0038	murF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0039	mraY	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0040	murD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0041	murG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0042	murC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0043	ddlB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0044	lpxC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0045	mutT	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0046	coaE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0048	nadC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0051	aceE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0052	aceF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0053	lpdA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0054	acnB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0060	can	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0061	panD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0062	panC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0063	panB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0064	folK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0065	mrcB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0071	hemL	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0074	mtnN	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0076	dapD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0077	pyrH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0078	dxr	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0079	uppS	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0080	cdsA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0081	lpxD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0082	fabZ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0083	lpxA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0084	lpxB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0085	accA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0094	fadE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0099	proB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0100	proA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0103	argF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0110	yahI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0116	cynT	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0125	mhpF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0134	hemB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0135	ddlA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0137	proC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0138	aroL	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0139	mak	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0144	ribD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0145	ribH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0146	thiL	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0149	dxs	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0150	ispA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0151	thiI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0152	panE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0162	tesB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0167	adk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0168	hemH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0175	gcl	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0177	glxR	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0183	arcC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0184	purK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0185	purE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0186	lpxH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0188	folD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0221	mrdA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0223	nadD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0225	hscC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0238	fldA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0246	gltA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0253	sucC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0254	sucD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0260	nadA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0263	aroG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0264	gpmA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0273	pgl	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0274	bioA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0275	bioB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0276	bioF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0277	bioC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0278	bioD1	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0279	moaA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0280	moaC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0281	moaD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0282	moaE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0291	moeB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0292	moeA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0300	ybjG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0313	ltaE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0318	trxB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0323	pflA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0324	pflB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0326	serC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0327	aroA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0328	cmk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0330	lpxK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0331	kdsB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0332	aspC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0342	pyrD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0368	pyrC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0372	fabH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0373	fabD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0374	fabG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0375	acpP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0376	fabF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0377	pabC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0378	tmk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0389	purB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0391	icd	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0395	dadX	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0403	prs	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0404	ispE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0405	hemA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0406	kdsA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0416	adhE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0425	trpA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0426	trpB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0427	trpC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0428	trpD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0429	trpE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0431	acnA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0432	ribA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0433	pgpB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0435	pyrF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0436	fabI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0439	puuA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0451	ydbK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0466	aldA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0514	folM	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0515	fumC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0516	fumA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0519	malY	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0531	ribE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0540	ydiB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0541	aroD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0544	aroH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0554	nadE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0559	astC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0561	gdhA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0567	gapA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0572	pabB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0577	purT	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0578	eda	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0579	edd	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0580	zwf	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0586	nudB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0605	hisG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0606	hisD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0607	hisC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0608	hisB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0609	hisH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0610	hisA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0611	hisF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0612	hisI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0641	thiD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0657	folE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0682	atoB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0691	nudI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0717	yfbQ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0719	ackA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0720	pta	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0727	ubiX	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0728	purF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0729	folC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0730	accD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0731	pdxB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0732	fabB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0734	aroC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0735	fadJ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0736	fadI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0742	yfdZ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0743	glk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0746	gltX	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0750	cysK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0757	cysM	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0765	hemF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0768	eutD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0770	talA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0771	tktB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0774	dapE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0775	purC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0776	dapA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0791	purM	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0793	ppk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0795	guaA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0796	guaB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0798	ispG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0799	ndk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0803	iscA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0804	nifU	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0805	iscS	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0813	glyA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0815	purL	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0818	pdxJ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0819	nadB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0821	grcA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0822	trxC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0823	pssA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0825	pheA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0826	tyrA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0827	aroF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0828	ppnK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0839	luxS	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0848	gutQ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0866	ispF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0867	ispD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0868	cysC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0869	cysN	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0870	cysD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0871	cysH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0872	cysI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0873	cysJ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0875	eno	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0876	pyrG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0893	argA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0894	thyA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0896	aas	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0897	lysA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0903	yqeA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0911	fldB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0918	serA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0919	rpiA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0925	pgk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0926	epd	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0928	tktA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0931	metK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0941	glcD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0951	metC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0953	plsC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0960	ribB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0962	uppP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0964	folB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0974	tdcE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0975	tdcD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0977	tdcB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0978	garK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0979	garR	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0986	argG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0987	glmM	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0988	folP	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0990	ispB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0991	murA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0993	kdsD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_0994	kdsC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1004	mdh	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1005	accB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1006	accC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1010	aroE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1014	argD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1015	pabA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1019	cysG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1023	yhfW	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1026	rpe	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1027	aroB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1028	aroK	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1029	mrcA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1034	bioH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1045	asd	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1086	xylA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1105	cysE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1106	gpsA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1108	gpmI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1109	tdh	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1110	kbl	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1125	waaA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1126	coaD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1127	coaBC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1128	dut	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1129	pyrE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1130	gmk	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1136	ilvN	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1137	ilvB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1141	tnaA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1149	glmS	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1150	glmU	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1160	asnA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1167	ilvE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1168	ilvD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1169	ilvA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1170	ilvC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1172	trxA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1184	hemX	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1185	hemD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1186	hemC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1188	cyaY	cell	$mmol \cdot l^{-1}$	☑	☑
e_1189	dapF	cell	$mmol \cdot l^{-1}$	☑	☑
e_1196	metE	cell	$mmol \cdot l^{-1}$	☑	☑
e_1200	ubiD	cell	$mmol \cdot l^{-1}$	☑	☑
e_1201	fre	cell	$mmol \cdot l^{-1}$	☑	☑
e_1202	fadA	cell	$mmol \cdot l^{-1}$	☑	☑
e_1203	fadB	cell	$mmol \cdot l^{-1}$	☑	☑
e_1205	hemG	cell	$mmol \cdot l^{-1}$	☑	☑
e_1206	mobB	cell	$mmol \cdot l^{-1}$	☑	☑
e_1207	mobA	cell	$mmol \cdot l^{-1}$	☑	☑
e_1210	glnA	cell	$mmol \cdot l^{-1}$	☑	☑
e_1226	tpiA	cell	$mmol \cdot l^{-1}$	☑	☑
e_1227	fpr	cell	$mmol \cdot l^{-1}$	☑	☑
e_1232	metB	cell	$mmol \cdot l^{-1}$	☑	☑
e_1233	metL	cell	$mmol \cdot l^{-1}$	☑	☑
e_1234	metF	cell	$mmol \cdot l^{-1}$	☑	☑
e_1238	pflD	cell	$mmol \cdot l^{-1}$	☑	☑
e_1239	pflC	cell	$mmol \cdot l^{-1}$	☑	☑
e_1240	ppc	cell	$mmol \cdot l^{-1}$	☑	☑
e_1241	argE	cell	$mmol \cdot l^{-1}$	☑	☑
e_1242	argC	cell	$mmol \cdot l^{-1}$	☑	☑
e_1243	argB	cell	$mmol \cdot l^{-1}$	☑	☑
e_1244	argH	cell	$mmol \cdot l^{-1}$	☑	☑
e_1247	murI	cell	$mmol \cdot l^{-1}$	☑	☑
e_1248	murB	cell	$mmol \cdot l^{-1}$	☑	☑
e_1249	coaA	cell	$mmol \cdot l^{-1}$	☑	☑
e_1250	thiH	cell	$mmol \cdot l^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1251	thiG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1252	thiF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1253	thiE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1254	thiC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1256	hemE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1257	purD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1258	purH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1259	metA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1262	metH	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1263	lysC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1264	pgi	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1271	ubiC	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1272	ubiA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1273	plsB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1275	alr	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1276	tyrB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1277	aphA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1291	rpiB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1298	fumB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1312	psd	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1313	rsgA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1315	purA	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1326	cysQ	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1334	nrdG	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1335	nrdD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1339	pyrI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1340	pyrB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1341	argI	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1355	sgcE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1366	deoB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1367	deoD	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1369	serB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1373	gpmB	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1374	thiS	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1376	glcF	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑
e_1377	glcE	cell	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑	☑

5 Function definition

This is an overview of one function definition.

5.1 Function definition `max`

Arguments x, y

Mathematical Expression

$$\frac{x + y + |x - y|}{2} \tag{1}$$

6 Reactions

This model contains 399 reactions. All reactions are listed in the following table and are subsequently described in detail. If a reaction is affected by a modifier, the identifier of this species is written above the reaction arrow.

Table 4: Overview of all reactions

№	Id	Name	Reaction Equation	SBO
1	r_0001	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran synthesis (spontaneous)	s_0004 $\overset{\text{s_0004, s_0003}}{\rightleftharpoons}$ s_0003	0000176
2	r_0008	1-(5-phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino)imidazole-4-carboxamide isomerase	s_0097 $\overset{\text{e_0610, s_0097, s_0341}}{\rightleftharpoons}$ s_0341	0000176
3	r_0009	1-deoxy-D-xylulose 5-phosphate synthase	s_0913 + s_1531 $\overset{\text{e_0149, s_0913, s_1531, s_0543, s_0116}}{\rightleftharpoons}$ s_0543 + s_0116	0000176
4	r_0011	1-deoxy-D-xylulose reductoisomerase	s_0116 + s_1336 $\overset{\text{e_0078, s_0116, s_1336, s_0194, s_1335}}{\rightleftharpoons}$ s_0194 + s_1335	0000176
5	r_0012	1-hexadec-7-enoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:1)	s_0119 + s_0533 $\overset{\text{e_0953, s_0119, s_0533, s_0397, s_0073}}{\rightleftharpoons}$ s_0397 + s_0073	0000176
6	r_0013	1-hexadecanoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:0)	s_0121 + s_1411 $\overset{\text{e_0953, s_0121, s_1411, s_0397, s_0075}}{\rightleftharpoons}$ s_0397 + s_0075	0000176
7	r_0014	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate reductase (dmpp)	s_0123 + s_1334 $\overset{\text{e_0010, s_0123, s_1334, s_0779, s_1333}}{\rightleftharpoons}$ s_0779 + s_1333	0000176
8	r_0015	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate reductase (ipdp)	s_0123 + s_1334 $\overset{\text{e_0010, s_0123, s_1334, s_1028, s_1333}}{\rightleftharpoons}$ s_1028 + s_1333	0000176

№	Id	Name	Reaction Equation	SBO
9	r_0038	2-aceto-2-hydroxybutanoate synthase	s_0232 + s_1531 $\xrightleftharpoons{\text{e_1137, e_0034, e_0035, e_1136, s_0232, s_1531, s_0041, s_0543}}$ s_0 s_0543	0000176
10	r_0053	2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase	s_0237 $\xrightleftharpoons{\text{e_0866, s_0237, s_0193, s_0539}}$ s_0193 + s_0539	0000176
11	r_0054	2-C-methyl-D-erythritol 4-phosphate cytidylyltransferase	s_0194 + s_0575 $\xrightleftharpoons{\text{e_0867, s_0194, s_0575, s_0312, s_0783}}$ s_0362 + s_0783	0000176
12	r_0056	2-dehydro-3-deoxy-phosphogluconate aldolase	s_0201 $\xrightleftharpoons{\text{e_0578, s_0201, s_0913, s_1531}}$ s_0913 + s_1531	0000176
13	r_0063	2-dehydropantoate 2-reductase	s_0203 + s_1336 $\xrightleftharpoons{\text{e_0152, e_1170, s_0203, s_1336, s_1335, s_0032}}$ s_1335 + s_0032	0000176
14	r_0066	2-isopropylmalate hydratase	s_0266 $\xrightleftharpoons{\text{e_0031, e_0030, s_0266, s_0217}}$ s_0217	0000176
15	r_0067	2-isopropylmalate synthase	s_0282 + s_0395 $\xrightleftharpoons{\text{e_0033, s_0282, s_0395, s_0266, s_0555}}$ s_0266 + s_0555	0000176
16	r_0078	2-Oxo-4-methyl-3-carboxypentanoate decarboxylation	s_0267 $\xrightleftharpoons{\text{s_0267, s_0328, s_0543}}$ s_0328 + s_0543	0000176
17	r_0084	2C-methyl-D-erythritol 2,4 cyclodiphosphate dehydratase	s_0193 + 2 s_0861 $\xrightleftharpoons{\text{e_0238, e_0798, e_0911, s_0193, s_0861, s_0862, s_0123}}$ 2 s_0862 + s_0123	0000176
18	r_0085	3',5'-bisphosphate nucleotidase	s_0411 $\xrightleftharpoons{\text{e_1326, s_0411, s_0454, s_1430}}$ s_0454 + s_1430	0000176
19	r_0092	3,4-Dihydroxy-2-butanone-4-phosphate synthase	s_0704 $\xrightleftharpoons{\text{e_0960, s_0704, s_0255, s_0867}}$ s_0255 + s_0867	0000176
20	r_0096	3-cis-2-trans-enoyl-CoA isomerase	s_1674 $\xrightleftharpoons{\text{e_1203, s_1674, s_0979}}$ s_0979	0000176

№	Id	Name	Reaction Equation	SBO
21	r_0098	3-dehydroquinate dehydratase, irreversible	s_0269 $\xrightleftharpoons{\text{e\_0541, s\_0269, s\_0270}}$ s_0270	0000176
22	r_0099	3-dehydroquinate synthase	s_0195 $\xrightleftharpoons{\text{e\_1027, s\_0195, s\_0269, s\_1430}}$ s_0269 + s_1430	0000176
23	r_0100	3-deoxy -D-manno-octulosonic -acid 8-phosphate synthase	s_0611 + s_1484 $\xrightleftharpoons{\text{e\_0406, s\_0611, s\_1484, s\_0272, s\_1430}}$ s_0272 + s_1430	0000176
24	r_0101	3-deoxy-D-arabino-heptulosonate 7-phosphate synthetase	s_0621 + s_1484 $\xrightleftharpoons{\text{e\_0544, e\_0827, e\_0263, s\_0621, s\_1484, s\_0195, s\_1430}}$ s_0195 + s_1430	0000176
25	r_0102	3-deoxy-D-manno-octulosonic acid transferase	s_0542 + s_0147 $\xrightleftharpoons{\text{e\_1125, s\_0542, s\_0147, s\_0539, s\_1038}}$ s_0539 + s_1038	0000176
26	r_0103	3-deoxy-D-manno-octulosonic acid transferase	s_0542 + s_1038 $\xrightleftharpoons{\text{e\_1125, s\_0542, s\_1038, s\_0539, s\_1033}}$ s_0539 + s_1033	0000176
27	r_0105	3-deoxy-manno-octulosonate cytidylyltransferase	s_0575 + s_0271 $\xrightleftharpoons{\text{e\_0331, s\_0575, s\_0271, s\_0542, s\_0783}}$ s_0542 + s_0783	0000176
28	r_0106	3-deoxy-manno-octulosonate-8-phosphatase	s_0272 $\xrightleftharpoons{\text{e\_0994, s\_0272, s\_0271, s\_1430}}$ s_0271 + s_1430	0000176
29	r_0120	3-hydroxyacyl-CoA dehydratase (3-hydroxybutanoyl-CoA)	s_0043 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0043, s\_0574}}$ s_0574	0000176
30	r_0121	3-hydroxyacyl-CoA dehydratase (3-hydroxydecanoyl-CoA)	s_0044 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0044, s\_1668}}$ s_1668	0000176
31	r_0122	3-hydroxyacyl-CoA dehydratase (3-hydroxydodecanoyl-CoA)	s_0045 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0045, s\_1670}}$ s_1670	0000176
32	r_0123	3-hydroxyacyl-CoA dehydratase (3-hydroxyhexadecanoyl-CoA)	s_0046 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0046, s\_1674}}$ s_1674	0000176

№	Id	Name	Reaction Equation	SBO
33	r_0124	3-hydroxyacyl-CoA dehydratase (3-hydroxyhexanoyl-CoA)	s_0047 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0047, s\_1672}}$ s_1672	0000176
34	r_0126	3-hydroxyacyl-CoA dehydratase (3-hydroxyoctanoyl-CoA)	s_0049 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0049, s\_1676}}$ s_1676	0000176
35	r_0127	3-hydroxyacyl-CoA dehydratase (3-hydroxytetradecanoyl-CoA)	s_0050 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0050, s\_1680}}$ s_1680	0000176
36	r_0128	3-hydroxyacyl-CoA dehydrogenase (3-oxodecanoyl-CoA)	s_0293 + s_1334 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0293, s\_1334, s\_0044, s\_1333}}$ s_0044 + s_1333	0000176
37	r_0129	3-hydroxyacyl-CoA dehydrogenase (3-oxododecanoyl-CoA)	s_0295 + s_1334 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0295, s\_1334, s\_0045, s\_1333}}$ s_0045 + s_1333	0000176
38	r_0130	3-hydroxyacyl-CoA dehydrogenase (3-oxohexadecanoyl-CoA)	s_0297 + s_1334 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0297, s\_1334, s\_0046, s\_1333}}$ s_0046 + s_1333	0000176
39	r_0131	3-hydroxyacyl-CoA dehydrogenase (3-oxohexanoyl-CoA)	s_0299 + s_1334 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0299, s\_1334, s\_0047, s\_1333}}$ s_0047 + s_1333	0000176
40	r_0133	3-hydroxyacyl-CoA dehydrogenase (3-oxooctanoyl-CoA)	s_0303 + s_1334 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0303, s\_1334, s\_0049, s\_1333}}$ s_0049 + s_1333	0000176
41	r_0134	3-hydroxyacyl-CoA dehydrogenase (3-oxotetradecanoyl-CoA)	s_0305 + s_1334 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0305, s\_1334, s\_0050, s\_1333}}$ s_0050 + s_1333	0000176
42	r_0135	3-hydroxyacyl-CoA dehydrogenase (acetoacetyl-CoA)	s_0391 + s_1334 $\xrightleftharpoons{\text{e\_1203, e\_0735, s\_0391, s\_1334, s\_0043, s\_1333}}$ s_0043 + s_1333	0000176
43	r_0138	3-isopropylmalate dehydratase	s_0217 $\xrightleftharpoons{\text{e\_0031, e\_0030, s\_0217, s\_0265}}$ s_0265	0000176
44	r_0139	3-isopropylmalate dehydrogenase	s_0265 + s_1333 $\xrightleftharpoons{\text{e\_0032, s\_0265, s\_1333, s\_0267, s\_1334}}$ s_0267 + s_1334	0000176

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45	r_0143	3-methyl-2-oxobutanoate hydroxymethyltransferase	$s\_0282 + s\_0336 \xrightleftharpoons{e\_0063,\ s\_0282,\ s\_0336,\ s\_0203,\ s\_0337} s\_0763 + s\_0337$	0000176
46	r_0145	3-Oxo-glutaryl-[ACP] methyl ester dehydratase	$s\_0276 \xrightleftharpoons{e\_0082,\ s\_0276,\ s\_0812} s\_0812$	0000176
47	r_0146	3-Oxo-glutaryl-[ACP] methyl ester reductase	$s\_1336 + s\_0289 \xrightleftharpoons{e\_0374,\ s\_1336,\ s\_0289,\ s\_0276,\ s\_1335} s\_0276 + s\_1335$	0000176
48	r_0147	3-Oxo-glutaryl-[ACP] methyl ester synthase	$s\_1216 + s\_1218 \xrightleftharpoons{e\_0372,\ s\_1216,\ s\_1218,\ s\_0543,\ s\_0555,\ s\_0289} s\_0543 + s\_0555 + s\_0289$	0000176
49	r_0148	3-Oxo-pimeloyl-[ACP] methyl ester dehydratase	$s\_0277 \xrightleftharpoons{e\_0082,\ s\_0277,\ s\_0813} s\_0813$	0000176
50	r_0149	3-Oxo-pimeloyl-[ACP] methyl ester reductase	$s\_1336 + s\_0290 \xrightleftharpoons{e\_0374,\ s\_1336,\ s\_0290,\ s\_0277,\ s\_1335} s\_0277 + s\_1335$	0000176
51	r_0150	3-Oxo-pimeloyl-[ACP] methyl ester synthase	$s\_0910 + s\_1216 \xrightleftharpoons{e\_0732,\ s\_0910,\ s\_1216,\ s\_0397,\ s\_0543,\ s\_0290} s\_0397 + s\_0543 + s\_0290$	0000176
52	r_0154	3-oxoacyl-[acyl-carrier-protein] reductase (n-C14:0)	$s\_0304 + s\_1336 \xrightleftharpoons{e\_0374,\ s\_0304,\ s\_1336,\ s\_0028,\ s\_1335} s\_0028 + s\_1335$	0000176
53	r_0166	3-oxoacyl-[acyl-carrier-protein] synthase (n-C14:0)	$s\_0789 + s\_1216 \xrightleftharpoons{e\_0376,\ e\_0732,\ s\_0789,\ s\_1216,\ s\_0304,\ s\_0397,\ s\_0543} s\_0304 + s\_0397 + s\_0543$	0000176
54	r_0175	3-phosphoshikimate 1-carboxyvinyltransferase	$s\_1484 + s\_1574 \xrightleftharpoons{e\_0327,\ s\_1484,\ s\_1574,\ s\_0359,\ s\_1430} s\_0359 + s\_1430$	0000176
55	r_0176	4,5-dihydroxy-2,3-pentanedione cyclization (spontaneous)	$s\_0310 \xrightleftharpoons{s\_0310,\ s\_0004} s\_0004$	0000176

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56	r_0178	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol kinase	s_0312 + s_0467 $\xrightleftharpoons{\text{e_0404, s_0312, s_0467, s_0237, s_0421}}$ s_0237 + s_0421	0000176
57	r_0179	4-amino-2-methyl-5-phosphomethylpyrimidine synthetase	s_0342 + s_1333 $\xrightleftharpoons{\text{e_1254, s_0342, s_1333, s_0313, s_0867, s_1334}}$ s_0313 + 2 s_0867 + s_1334	0000176
58	r_0181	4-amino-4-deoxychorismate synthase	s_0526 + s_1101 $\xrightleftharpoons{\text{e_1015, e_0572, s_0526, s_1101, s_0316, s_1095}}$ s_0316 + s_1095	0000176
59	r_0182	4-aminobenzoate synthase	s_0316 $\xrightleftharpoons{\text{e_0377, s_0316, s_0318, s_1531}}$ s_0318 + s_1531	0000176
60	r_0186	5'-deoxyadenosine nuclosidase	s_0333 $\xrightleftharpoons{\text{e_0074, s_0333, s_0334, s_0405}}$ s_0334 + s_0405	0000176
61	r_0211	5,10-methylenetetrahydrofolate reductase (NADH)	s_0336 + s_1334 $\xrightleftharpoons{\text{e_1234, s_0336, s_1334, s_0354, s_1333}}$ s_0354 + s_1333	0000176
62	r_0212	5-amino-6-(5-phosphoribosylamino)uracil reductase	s_0347 + s_1336 $\xrightleftharpoons{\text{e_0144, s_0347, s_1336, s_0346, s_1335}}$ s_0346 + s_1335	0000176
63	r_0216	6-hydroxymethyl-dihydropterin pyrophosphokinase	s_0367 + s_0467 $\xrightleftharpoons{\text{e_0064, s_0367, s_0467, s_0368, s_0454}}$ s_0368 + s_0454	0000176
64	r_0217	6-phosphogluconate dehydratase	s_0369 $\xrightleftharpoons{\text{e_0579, s_0369, s_0201}}$ s_0201	0000176
65	r_0218	6-phosphogluconolactonase	s_0370 $\xrightleftharpoons{\text{e_0273, s_0370, s_0369}}$ s_0369	0000176
66	r_0222	8-amino-7-oxononanoate synthase	s_1041 + s_1491 $\xrightleftharpoons{\text{e_0276, s_1041, s_1491, s_0376, s_0397, s_0543}}$ s_0376 + s_0397 + s_0543	0000176
67	r_0224	acetaldehyde dehydrogenase (acetylating)	s_0381 + s_0555 + s_1333 $\xrightleftharpoons{\text{e_0125, e_0416, s_0381, s_0555, s_1333, s_0395, s_1334}}$ s_0395 + s_1334	0000176

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68	r_0225	acetate kinase	s_0384 + s_0467 $\xrightleftharpoons{\text{e_0975, e_0719, e_0577, s_0384, s_0467, s_0393, s_0421}}$ s_0393 + s_0421	0000176
69	r_0227	acetolactate synthase	2 s_1531 $\xrightleftharpoons{\text{e_1137, e_0034, e_0035, e_1136, s_1531, s_0042, s_0543}}$ s_0042 + s_0543	0000176
70	r_0230	acetyl-CoA C-acetyltransferase	2 s_0395 $\xrightleftharpoons{\text{e_0682, e_1202, e_0736, s_0395, s_0391, s_0555}}$ s_0391 + s_0555	0000176
71	r_0231	acetyl-CoA C-acyltransferase (butanoyl-CoA) (r)	s_0395 + s_0488 $\xrightleftharpoons{\text{e_1202, e_0736, s_0395, s_0488, s_0299, s_0555}}$ s_0299 + s_0555	0000176
72	r_0232	acetyl-CoA C-acyltransferase (decanoyl-CoA) (r)	s_0395 + s_0737 $\xrightleftharpoons{\text{e_1202, e_0736, s_0395, s_0737, s_0295, s_0555}}$ s_0295 + s_0555	0000176
73	r_0233	acetyl-CoA C-acyltransferase (dodecanoyl-CoA) (r)	s_0395 + s_0790 $\xrightleftharpoons{\text{e_1202, e_0736, s_0395, s_0790, s_0305, s_0555}}$ s_0305 + s_0555	0000176
74	r_0234	acetyl-CoA C-acyltransferase (hexanoyl-CoA) (r)	s_0395 + s_0984 $\xrightleftharpoons{\text{e_1202, e_0736, s_0395, s_0984, s_0303, s_0555}}$ s_0303 + s_0555	0000176
75	r_0235	acetyl-CoA C-acyltransferase (octanoyl-CoA) (r)	s_0395 + s_1390 $\xrightleftharpoons{\text{e_1202, e_0736, s_0395, s_1390, s_0293, s_0555}}$ s_0293 + s_0555	0000176
76	r_0236	acetyl-CoA C-acyltransferase (tetradecanoyl-CoA) (r)	s_0395 + s_1632 $\xrightleftharpoons{\text{e_1202, e_0736, s_0395, s_1632, s_0297, s_0555}}$ s_0297 + s_0555	0000176
77	r_0237	acetyl-CoA carboxylase	s_0395 + s_0467 + s_0474 $\xrightleftharpoons{\text{e_0085, e_1006, e_1005, e_0730, s_0395, s_0467, s_0474, s_0421, s_1217, s_14}}$ s_1217 + s_1430	0000176
78	r_0243	acetylglutamate kinase	s_1302 + s_0467 $\xrightleftharpoons{\text{e_1243, s_1302, s_0467, s_1304, s_0421}}$ s_1304 + s_0421	0000176

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79	r_0244	acetylornithine deacetylase	s_1321 $\xrightleftharpoons{\text{e\_1241, s\_1321, s\_0384, s\_1391}}$ s_0384 + s_1391	0000176
80	r_0245	acetylornithine transaminase	s_1303 + s_1095 $\xrightleftharpoons{\text{e\_0559, e\_1014, s\_1303, s\_1095, s\_1321, s\_0233}}$ s_1321 + s_0233	0000176
81	r_0246	aconitase (half-reaction A, Citrate hydro-lyase)	s_0536 $\xrightleftharpoons{\text{e\_0431, e\_0054, s\_0536, s\_0530}}$ s_0530	0000176
82	r_0247	aconitase (half-reaction B, Isocitrate hydro-lyase)	s_0530 $\xrightleftharpoons{\text{e\_0431, e\_0054, s\_0530, s\_1027}}$ s_1027	0000176
83	r_0257	acyl-[acyl-carrier-protein] synthetase (n-C12:0)	s_0397 + s_0467 + s_0785 $\xrightleftharpoons{\text{e\_0375, e\_0896, s\_0397, s\_0467, s\_0785, s\_0454, s\_0789, s\_0783}}$ s_0454 + s_0789 + s_0783	0000176
84	r_0259	acyl-[acyl-carrier-protein] synthetase (n-C16:0)	s_0397 + s_0467 + s_0971 $\xrightleftharpoons{\text{e\_0375, e\_0896, s\_0397, s\_0467, s\_0971, s\_0454, s\_1411, s\_0783}}$ s_0454 + s_1411 + s_0783	0000176
85	r_0260	acyl-[acyl-carrier-protein] synthetase (n-C16:1)	s_0397 + s_0467 + s_0976 $\xrightleftharpoons{\text{e\_0375, e\_0896, s\_0397, s\_0467, s\_0976, s\_0454, s\_0533, s\_0783}}$ s_0454 + s_0533 + s_0783	0000176
86	r_0266	acyl-CoA dehydrogenase (butanoyl-CoA)	s_0574 + s_0860 $\xrightleftharpoons{\text{e\_0094, s\_0574, s\_0860, s\_0488, s\_0859}}$ s_0488 + s_0859	0000768
87	r_0267	acyl-CoA dehydrogenase (decanoyl-CoA)	s_1668 + s_0860 $\xrightleftharpoons{\text{e\_0094, s\_1668, s\_0860, s\_0737, s\_0859}}$ s_0737 + s_0859	0000767
88	r_0268	acyl-CoA dehydrogenase (dodecanoyl-CoA)	s_1670 + s_0860 $\xrightleftharpoons{\text{e\_0094, s\_1670, s\_0860, s\_0790, s\_0859}}$ s_0790 + s_0859	0000769

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89	r_0269	acyl-CoA dehydrogenase (hexadecanoyl-CoA)	s_0860 + s_1674 $\overset{\text{e_0094, s_0860, s_1674, s_0859, s_1412}}{\rightleftharpoons}$ s_0859 + s_1412	0000176
90	r_0270	acyl-CoA dehydrogenase (hexanoyl-CoA)	s_0860 + s_1672 $\overset{\text{e_0094, s_0860, s_1672, s_0859, s_0984}}{\rightleftharpoons}$ s_0859 + s_0984	0000176
91	r_0272	acyl-CoA dehydrogenase (octanoyl-CoA)	s_0860 + s_1676 $\overset{\text{e_0094, s_0860, s_1676, s_0859, s_1390}}{\rightleftharpoons}$ s_0859 + s_1390	0000176
92	r_0273	acyl-CoA dehydrogenase (tetradecanoyl-CoA)	s_0860 + s_1680 $\overset{\text{e_0094, s_0860, s_1680, s_0859, s_1632}}{\rightleftharpoons}$ s_0859 + s_1632	0000176
93	r_0292	adenosine kinase	s_0408 + s_0467 $\overset{\text{e_0167, s_0408, s_0467, s_0421, s_0454}}{\rightleftharpoons}$ s_0421 + s_0454	0000176
94	r_0297	adenosylmethionine-8-amino-7-oxononanoate transaminase	s_0376 + s_1552 $\overset{\text{e_0274, s_0376, s_1552, s_1550, s_0371}}{\rightleftharpoons}$ s_1550 + s_0371	0000176
95	r_0301	adenylate kinase	s_0454 + s_0467 $\overset{\text{e_0167, s_0454, s_0467, s_0421}}{\rightleftharpoons}$ 2 s_0421	0000176
96	r_0302	adenylosuccinate lyase	s_0040 $\overset{\text{e_0389, s_0040, s_0343, s_0875}}{\rightleftharpoons}$ s_0343 + s_0875	0000176
97	r_0303	adenylosuccinate synthase	s_1072 + s_0945 + s_1006 $\overset{\text{e_1315, s_1072, s_0945, s_1006, s_1327, s_0896, s_1430}}{\rightleftharpoons}$ s_1327 + s_0896 + s_1430	0000176
98	r_0304	adenylsuccinate lyase	s_1327 $\overset{\text{e_0389, s_1327, s_0454, s_0875}}{\rightleftharpoons}$ s_0454 + s_0875	0000176
99	r_0305	adenylyl-sulfate kinase	s_0412 + s_0467 $\overset{\text{e_0868, s_0412, s_0467, s_0421, s_0252}}{\rightleftharpoons}$ s_0421 + s_0252	0000176
100	r_0310	alanine racemase	s_1041 $\overset{\text{e_0395, e_1275, s_1041, s_0600}}{\rightleftharpoons}$ s_0600	0000176

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101	r_0348	anthranilate phosphoribosyltransferase	s_0457 + s_0360 $\xrightleftharpoons{\text{e_0428, s_0457, s_0360, s_0783, s_1278}}$ s_0360 + s_1278	0000176
102	r_0349	anthranilate synthase	s_0526 + s_1101 $\xrightleftharpoons{\text{e_0429, e_0428, s_0526, s_1101, s_0457, s_1095, s_1531}}$ s_0457 + s_1095 + s_1531	0000176
103	r_0355	arabinose-5-phosphate isomerase	s_0704 $\xrightleftharpoons{\text{e_0993, e_0848, s_0704, s_0611}}$ s_0611	0000176
104	r_0360	argininosuccinate lyase	s_1274 $\xrightleftharpoons{\text{e_1244, s_1274, s_1061, s_0875}}$ s_1061 + s_0875	0000176
105	r_0361	argininosuccinate synthase	s_1072 + s_0467 + s_1081 $\xrightleftharpoons{\text{e_0986, s_1072, s_0467, s_1081, s_0454, s_1274, s_0783}}$ s_0454 + s_1274 + s_0783	0000176
106	r_0365	asparagine synthetase	s_1072 + s_0467 + s_0451 $\xrightleftharpoons{\text{e_1160, s_1072, s_0467, s_0451, s_0454, s_1068, s_0783}}$ s_0454 + s_1068 + s_0783	0000176
107	r_0367	aspartate 1-decarboxylase	s_1072 $\xrightleftharpoons{\text{e_0061, s_1072, s_0470, s_0543}}$ s_0470 + s_0543	0000176
108	r_0368	aspartate carbamoyltransferase	s_1072 + s_0502 $\xrightleftharpoons{\text{e_1340, e_1339, s_1072, s_0502, s_1312, s_1430}}$ s_1312 + s_1430	0000176
109	r_0369	aspartate kinase	s_1072 + s_0467 $\xrightleftharpoons{\text{e_1263, e_0001, e_1233, s_1072, s_0467, s_0332, s_0421}}$ s_0332 + s_0421	0000176
110	r_0370	aspartate transaminase	s_1095 + s_1399 $\xrightleftharpoons{\text{e_0332, s_1095, s_1399, s_0233, s_1072}}$ s_0233 + s_1072	0000176
111	r_0371	aspartate-semialdehyde dehydrogenase	s_0332 + s_1336 $\xrightleftharpoons{\text{e_1045, s_0332, s_1336, s_1075, s_1335, s_1430}}$ s_1075 + s_1335 + s_1430	0000176

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112	r_0374	ATP phosphoribosyltransferase	s_0467 + s_0360 $\xrightleftharpoons{\text{e_0605, s_0467, s_0360, s_0783, s_0099}}$ s_0099 + s_0783	0000176
113	r_0383	Biotin synthase	s_0378 + s_1552 + s_0755 $\xrightleftharpoons{\text{e_0275, s_0378, s_1552, s_0755, s_0377, s_0476, s_0333, s_1141}}$ s_0377 + s_0476 + s_0333 + s_1141	0000176
114	r_0384	bis-molybdenum cofactor synthase	s_1264 + s_0420 $\xrightleftharpoons{\text{e_0292, s_1264, s_0420, s_0454, s_0479, s_0579}}$ s_0454 + s_0479 + s_0579	0000176
115	r_0385	bis-molybdopterin guanine dinucleotide synthase	s_0481 + s_0945 $\xrightleftharpoons{\text{e_1207, e_1206, s_0481, s_0945, s_0480, s_0783}}$ s_0480 + s_0783	0000176
116	r_0386	bis-molybdopterin guanine dinucleotide synthase (single GDP)	s_0479 + s_0945 $\xrightleftharpoons{\text{e_1207, e_1206, s_0479, s_0945, s_0481, s_0783}}$ s_0481 + s_0783	0000176
117	r_0388	Carbamate kinase	s_0467 + s_0543 + s_0451 $\xrightleftharpoons{\text{e_0903, e_0183, e_0110, s_0467, s_0543, s_0451, s_0421, s_0502}}$ s_0421 + s_0502	0000176
118	r_0418	CDP-diacylglycerol synthetase (n-C16:0)	s_0575 + s_0075 $\xrightleftharpoons{\text{e_0080, s_0575, s_0075, s_0513, s_0783}}$ s_0513 + s_0783	0000176
119	r_0419	CDP-diacylglycerol synthetase (n-C16:1)	s_0575 + s_0073 $\xrightleftharpoons{\text{e_0080, s_0575, s_0073, s_0512, s_0783}}$ s_0512 + s_0783	0000176
120	r_0423	chorismate mutase	s_0526 $\xrightleftharpoons{\text{e_0825, e_0826, s_0526, s_1497}}$ s_1497	0000176
121	r_0424	Chorismate pyruvate lyase	s_0526 $\xrightleftharpoons{\text{e_1271, s_0526, s_0325, s_1531}}$ s_0325 + s_1531	0000176
122	r_0425	chorismate synthase	s_0359 $\xrightleftharpoons{\text{e_0734, s_0359, s_0526, s_1430}}$ s_0526 + s_1430	0000176

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123	r_0428	citrate synthase	s_0395 + s_1399 $\xrightleftharpoons{\text{e_0246, s_0395, s_1399, s_0536, s_0555}}$ s_0536 + s_0555	0000176
124	r_0436	coproporphyrinogen oxidase (O2 required)	s_0565 + s_1372 $\xrightleftharpoons{\text{e_0765, s_0565, s_1372, s_0543, s_1512}}$ s_0543 + s_1512	0000176
125	r_0440	CTP synthase (glutamine)	s_0467 + s_1101 + s_1792 $\xrightleftharpoons{\text{e_0876, s_0467, s_1101, s_1792, s_0421, s_0575, s_1095, s_1430}}$ s_0421 + s_0575 + s_1095 + s_1430	0000176
126	r_0445	cyclic pyranopterin monophosphate synthase	s_0945 $\xrightleftharpoons{\text{e_0279, e_0280, s_0945, s_0585, s_0783}}$ s_0585 + s_0783	0000176
127	r_0450	cystathionine b-lyase	s_1082 $\xrightleftharpoons{\text{e_0951, e_0519, s_1082, s_1112, s_0451, s_1531}}$ s_1112 + s_0451 + s_1531	0000176
128	r_0452	cysteine synthase	s_1358 + s_0994 $\xrightleftharpoons{\text{e_0757, e_0750, s_1358, s_0994, s_0384, s_1083}}$ s_0384 + s_1083	0000176
129	r_0457	cytidylate kinase (CMP)	s_0467 + s_0539 $\xrightleftharpoons{\text{e_0328, s_0467, s_0539, s_0421, s_0510}}$ s_0421 + s_0510	0000176
130	r_0463	D-alanine-D-alanine ligase (reversible)	2 s_0600 + s_0467 $\xrightleftharpoons{\text{e_0043, e_0135, s_0600, s_0467, s_0421, s_0603, s_1430}}$ s_0421 + s_0603 + s_1430	0000176
131	r_0488	dephospho-CoA kinase	s_0467 + s_0754 $\xrightleftharpoons{\text{e_0046, s_0467, s_0754, s_0421, s_0555}}$ s_0421 + s_0555	0000176
132	r_0489	dethiobiotin synthase	s_0467 + s_0543 + s_0371 $\xrightleftharpoons{\text{e_0278, s_0467, s_0543, s_0371, s_0421, s_0755, s_1430}}$ s_0421 + s_0755 + s_1430	0000176
133	r_0498	diaminohydroxyphosphoribosylaminopyrimidine deaminase (25drapp)	e0160 $\xrightleftharpoons{\text{e_0144, s_0160, s_0347, s_0451}}$ s_0347 + s_0451	0000176

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134	r_0499	diaminopimelate decarboxylase	s_1242 $\xrightleftharpoons{\text{e\_0897, s\_1242, s\_0543, s\_1131}}$ s_0543 + s_1131	0000176
135	r_0500	diaminopimelate epimerase	s_1211 $\xrightleftharpoons{\text{e\_1189, s\_1211, s\_1242}}$ s_1242	0000176
136	r_0501	dihydoorotic acid dehydrogenase (quinone8)	s_0052 + s_1732 $\xrightleftharpoons{\text{e\_0342, s\_0052, s\_1732, s\_1394, s\_1731}}$ s_1394 + s_1731	0000176
137	r_0502	dihydrodipicolinate reductase (NADPH)	s_0155 + s_1336 $\xrightleftharpoons{\text{e\_0012, s\_0155, s\_1336, s\_1335, s\_0148}}$ s_1335 + s_0148	0000176
138	r_0503	dihydrodipicolinate synthase	s_1075 + s_1531 $\xrightleftharpoons{\text{e\_0776, s\_1075, s\_1531, s\_0155}}$ s_0155	0000176
139	r_0504	dihydrofolate reductase	s_0372 + s_1336 $\xrightleftharpoons{\text{e\_0514, e\_0020, s\_0372, s\_1336, s\_1335, s\_0337}}$ s_1335 + s_0337	0000176
140	r_0505	dihydrofolate synthase	s_0467 + s_0767 + s_1095 $\xrightleftharpoons{\text{e\_0729, s\_0467, s\_0767, s\_1095, s\_0421, s\_0372, s\_1430}}$ s_0421 + s_0372 + s_1430	0000176
141	r_0507	dihydroneopterin aldolase reversible	s_0765 $\xrightleftharpoons{\text{e\_0964, s\_0765, s\_0367, s\_0936}}$ s_0367 + s_0936	0000176
142	r_0510	Dihydroneopterin triphosphate pyrophosphatase	s_0191 $\xrightleftharpoons{\text{e\_0045, e\_0586, s\_0191, s\_0766, s\_0783}}$ s_0766 + s_0783	0000176
143	r_0511	dihydroorotase	s_1312 $\xrightleftharpoons{\text{e\_0368, s\_1312, s\_0052}}$ s_0052	0000176
144	r_0512	dihydroorotic acid (menaquinone-8)	s_0052 + s_1240 $\xrightleftharpoons{\text{e\_0342, s\_0052, s\_1240, s\_1239, s\_1394}}$ s_1239 + s_1394	0000176
145	r_0515	dihydropteroate synthase	s_0318 + s_0368 $\xrightleftharpoons{\text{e\_0988, s\_0318, s\_0368, s\_0767, s\_0783}}$ s_0767 + s_0783	0000176

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146	r_0517	dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylbutanoate)	s_0017 $\xrightleftharpoons{\text{e\_1168, s\_0017, s\_0282}}$ s_0282	0000176
147	r_0518	Dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylpentanoate)	s_0018 $\xrightleftharpoons{\text{e\_1168, s\_0018, s\_0051}}$ s_0051	0000176
148	r_0522	dimethylallyltranstransferase	s_0779 + s_1028 $\xrightleftharpoons{\text{e\_0150, s\_0779, s\_1028, s\_0903, s\_0783}}$ s_0903 + s_0783	0000176
149	r_0532	dTMP kinase	s_0467 + s_0802 $\xrightleftharpoons{\text{e\_0378, s\_0467, s\_0802, s\_0421, s\_0795}}$ s_0421 + s_0795	0000176
150	r_0533	dUTP diphosphatase	s_0810 $\xrightleftharpoons{\text{e\_1128, e\_0691, s\_0810, s\_0807, s\_0783}}$ s_0807 + s_0783	0000176
151	r_0538	enolase	s_0675 $\xrightleftharpoons{\text{e\_0875, s\_0675, s\_1484}}$ s_1484	0000176
152	r_0563	Enoylglutaryl-[ACP] methyl ester reductase	s_0812 + s_1336 $\xrightleftharpoons{\text{e\_0436, s\_0812, s\_1336, s\_0910, s\_1335}}$ s_0910 + s_1335	0000176
153	r_0564	Enoylpimeloyl-[ACP] methyl ester reductase	s_0813 + s_1336 $\xrightleftharpoons{\text{e\_0436, s\_0813, s\_1336, s\_1335, s\_1492}}$ s_1335 + s_1492	0000176
154	r_0573	Erythronate 4-phosphate (4per) dehydrogenase	s_0331 + s_1333 $\xrightleftharpoons{\text{e\_0731, s\_0331, s\_1333, s\_1334, s\_0231}}$ s_1334 + s_0231	0000176
155	r_0574	Erythrose 4-phosphate dehydrogenase	s_0621 + s_1333 $\xrightleftharpoons{\text{e\_0926, e\_0567, s\_0621, s\_1333, s\_0331, s\_1334}}$ s_0331 + s_1334	0000176
156	r_0576	FAD reductase	s_0859 + s_1334 $\xrightleftharpoons{\text{e\_1201, s\_0859, s\_1334, s\_0860, s\_1333}}$ s_0860 + s_1333	0000176
157	r_0579	fatty-acid-CoA thioesterase (dodecanoate)	s_0790 $\xrightleftharpoons{\text{e\_0162, s\_0790, s\_0555, s\_0785}}$ s_0555 + s_0785	0000176

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158	r_0580	fatty-acid-CoA thioesterase (hexadecanoate)	s_1412 $\xrightleftharpoons{\text{e\_0162, s\_1412, s\_0555, s\_0971}}$ s_0555 + s_0971	0000176
159	r_0581	fatty-acid-CoA thioesterase (hexadecenoate)	s_0979 $\xrightleftharpoons{\text{e\_0162, s\_0979, s\_0555, s\_0976}}$ s_0555 + s_0976	0000176
160	r_0602	Ferrochelatase	s_0838 + s_1511 $\xrightleftharpoons{\text{e\_0168, s\_0838, s\_1511, s\_1508}}$ s_1508	0000176
161	r_0611	FMN adenylyltransferase	s_0467 + s_0863 $\xrightleftharpoons{\text{e\_0008, s\_0467, s\_0863, s\_0859, s\_0783}}$ s_0859 + s_0783	0000359
162	r_0622	formate-tetrahydrofolate ligase	s_0467 + s_0867 + s_0337 $\xrightleftharpoons{\text{s\_0467, s\_0867, s\_0337, s\_0133, s\_0421, s\_1430}}$ s_0133 + s_0421 + s_1430	0000176
163	r_0632	fumarase	s_0875 $\xrightleftharpoons{\text{e\_1298, e\_0515, e\_0516, s\_0875, s\_1138}}$ s_1138	0000176
164	r_0648	GAR transformylase-T	s_0467 + s_0867 + s_1318 $\xrightleftharpoons{\text{e\_0577, s\_0467, s\_0867, s\_1318, s\_0421, s\_1322, s\_1430}}$ s_0421 + s_1322 + s_1430	0000176
165	r_0655	geranyltranstransferase	s_0903 + s_1028 $\xrightleftharpoons{\text{e\_0150, s\_0903, s\_1028, s\_0826, s\_0783}}$ s_0826 + s_0783	0000176
166	r_0658	glucosamine-1-phosphate N-acetyltransferase	s_0395 + s_0653 $\xrightleftharpoons{\text{e\_1150, s\_0395, s\_0653, s\_1287, s\_0555}}$ s_1287 + s_0555	0000176
167	r_0660	glucose 6-phosphate dehydrogenase	s_0663 + s_1335 $\xrightleftharpoons{\text{e\_0580, s\_0663, s\_1335, s\_0370, s\_1336}}$ s_0370 + s_1336	0000176
168	r_0664	glucose-6-phosphate isomerase	s_0663 $\xrightleftharpoons{\text{e\_1264, s\_0663, s\_0627}}$ s_0627	0000176
169	r_0673	glutamate 5-kinase	s_0467 + s_1095 $\xrightleftharpoons{\text{e\_0099, s\_0467, s\_1095, s\_0421, s\_1099}}$ s_0421 + s_1099	0000176

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170	r_0675	glutamate dehydrogenase (NADP)	s_0233 + s_1336 + s_0451 $\xrightleftharpoons{\text{e_0561, s_0233, s_1336, s_0451, s_1095, s_1335}}$ s_1095 + s_1335	0000176
171	r_0676	glutamate racemase	s_1095 $\xrightleftharpoons{\text{e_1247, s_1095, s_0671}}$ s_0671	0000176
172	r_0678	glutamate-1-semialdehyde aminotransferase	s_1098 $\xrightleftharpoons{\text{e_0071, s_1098, s_0345}}$ s_0345	0000176
173	r_0679	glutamate-5-semialdehyde dehydrogenase	s_1099 + s_1336 $\xrightleftharpoons{\text{e_0100, s_1099, s_1336, s_1100, s_1335, s_1430}}$ s_1100 + s_1335 + s_1430	0000176
174	r_0682	glutamine phosphoribosyldiphosphate amidotransferase	s_1101 + s_0360 $\xrightleftharpoons{\text{e_0728, s_1101, s_0360, s_1095, s_0783, s_0361}}$ s_1095 + s_0783 + s_0361	0000176
175	r_0683	glutamine synthetase	s_0467 + s_1095 + s_0451 $\xrightleftharpoons{\text{e_1210, e_0439, s_0467, s_1095, s_0451, s_0421, s_1101, s_1430}}$ s_0421 + s_1101 + s_1430	0000176
176	r_0684	glutamine-fructose-6-phosphate transaminase	s_0627 + s_1101 $\xrightleftharpoons{\text{e_1149, s_0627, s_1101, s_0654, s_1095}}$ s_0654 + s_1095	0000176
177	r_0686	glutamyl-tRNA reductase	s_1105 + s_1336 $\xrightleftharpoons{\text{e_0405, s_1105, s_1336, s_1098, s_1335, s_1690}}$ s_1098 + s_1335 + s_1690	0000176
178	r_0687	Glutamyl-tRNA synthetase	s_0467 + s_1095 + s_1690 $\xrightleftharpoons{\text{e_0746, s_0467, s_1095, s_1690, s_0454, s_1105, s_0783}}$ s_0454 + s_1105 + s_0783	0000176
179	r_0695	glyceraldehyde-3-phosphate dehydrogenase	s_0913 + s_1333 + s_1430 $\xrightleftharpoons{\text{e_0567, s_0913, s_1333, s_1430, s_0307, s_1334}}$ s_0307 + s_1334	0000176
180	r_0697	glycerate kinase	s_0467 + s_0029 $\xrightleftharpoons{\text{e_0978, s_0467, s_0029, s_0675, s_0421}}$ s_0675 + s_0421	0000176

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181	r_0706	glycerol-3-phosphate acyltransferase (C16:0)	s_0920 + s_1411 $\xrightleftharpoons{\text{e_0375, e_1273, s_0920, s_1411, s_0121, s_0397}}$ s_0121 + s_0397	0000176
182	r_0707	glycerol-3-phosphate acyltransferase (C16:1)	s_0920 + s_0533 $\xrightleftharpoons{\text{e_0375, e_1273, s_0920, s_0533, s_0119, s_0397}}$ s_0119 + s_0397	0000176
183	r_0712	glycerol-3-phosphate dehydrogenase (NADP)	s_0772 + s_1336 $\xrightleftharpoons{\text{e_1106, s_0772, s_1336, s_0920, s_1335}}$ s_0920 + s_1335	0000176
184	r_0724	glycine C-acetyltransferase	s_1040 + s_0555 $\xrightleftharpoons{\text{e_1110, s_1040, s_0555, s_0395, s_0929}}$ s_0395 + s_0929	0000176
185	r_0726	glycine hydroxymethyltransferase, reversible	s_1170 + s_0337 $\xrightleftharpoons{\text{e_0813, s_1170, s_0337, s_0929, s_0336}}$ s_0929 + s_0336	0000176
186	r_0731	Glycolaldehyde dehydrogenase	s_0936 + s_1333 $\xrightleftharpoons{\text{e_0466, s_0936, s_1333, s_0937, s_1334}}$ s_0937 + s_1334	0000176
187	r_0734	Glycolate oxidase	s_0937 + s_1732 $\xrightleftharpoons{\text{e_1376, e_0941, e_1377, s_0937, s_1732, s_0941, s_1731}}$ s_0941 + s_1731	0000176
188	r_0735	Glycolate oxidase	s_0937 + s_1240 $\xrightleftharpoons{\text{e_1376, e_0941, e_1377, s_0937, s_1240, s_0941, s_1239}}$ s_0941 + s_1239	0000176
189	r_0739	glyoxalate carboligase	2 s_0941 $\xrightleftharpoons{\text{e_0175, s_0941, s_0214, s_0543}}$ s_0214 + s_0543	0000176
190	r_0741	GMP synthase	s_0467 + s_1101 + s_1799 $\xrightleftharpoons{\text{e_0795, s_0467, s_1101, s_1799, s_0454, s_1095, s_0942, s_0783}}$ s_0454 + s_1095 + s_0942 + s_0783	0000176
191	r_0744	GTP cyclohydrolase I	s_0945 $\xrightleftharpoons{\text{e_0657, s_0945, s_0191, s_0867}}$ s_0191 + s_0867	0000176

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192	r_0745	GTP cyclohydrolase II (25drapp)	s_0945 $\xrightleftharpoons{\text{e\_0432, s\_0945, s\_0160, s\_0867, s\_0783}}$ s_0160 + s_0867 + s_0783	0000176
193	r_0754	guanylate kinase (GMP:ATP)	s_0467 + s_0942 $\xrightleftharpoons{\text{e\_1130, s\_0467, s\_0942, s\_0421, s\_0896}}$ s_0421 + s_0896	0000178
194	r_0755	HCO3 equilibration reaction	s_0543 $\xrightleftharpoons{\text{e\_0060, e\_0116, s\_0543, s\_0474}}$ s_0474	0000176
195	r_0761	hexokinase (D-fructose:ATP)	s_0467 + s_0622 $\xrightleftharpoons{\text{e\_0139, s\_0467, s\_0622, s\_0421, s\_0627}}$ s_0421 + s_0627	0000178
196	r_0762	hexokinase (D-glucose:ATP)	s_0467 + s_0657 $\xrightleftharpoons{\text{e\_0743, s\_0467, s\_0657, s\_0421, s\_0663}}$ s_0421 + s_0663	0000178
197	r_0763	histidinol dehydrogenase	s_1109 + 2 s_1333 $\xrightleftharpoons{\text{e\_0606, s\_1109, s\_1333, s\_1106, s\_1334}}$ s_1106 + 2 s_1334	0000176
198	r_0764	histidinol-phosphatase	s_1110 $\xrightleftharpoons{\text{e\_0608, s\_1110, s\_1109, s\_1430}}$ s_1109 + s_1430	0000176
199	r_0765	histidinol-phosphate transaminase	s_1095 + s_0263 $\xrightleftharpoons{\text{e\_0607, s\_1095, s\_0263, s\_0233, s\_1110}}$ s_0233 + s_1110	0000255
200	r_0769	homoserine dehydrogenase (NADPH)	s_1075 + s_1336 $\xrightleftharpoons{\text{e\_0001, e\_1233, s\_1075, s\_1336, s\_1113, s\_1335}}$ s_1113 + s_1335	0000176
201	r_0770	homoserine kinase	s_0467 + s_1113 $\xrightleftharpoons{\text{e\_0002, s\_0467, s\_1113, s\_0421, s\_1363}}$ s_0421 + s_1363	0000178
202	r_0771	homoserine O-succinyltransferase	s_1113 + s_1599 $\xrightleftharpoons{\text{e\_1259, s\_1113, s\_1599, s\_0555, s\_1367}}$ s_0555 + s_1367	0000176
203	r_0775	Hydroxybenzoate octaprenyltransferase	s_0325 + s_0435 $\xrightleftharpoons{\text{e\_1272, s\_0325, s\_0435, s\_0283, s\_0783}}$ s_0283 + s_0783	0000178

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204	r_0777	hydroxymethylbilane synthase	$4\,s\_1493 \xrightleftharpoons{e\_1186,\ s\_1493,\ s\_0998,\ s\_0451} s\_0998 + 4\,s\_0451$	0000176
205	r_0784	Imidazole-glycerol-3-phosphate synthase	$s\_1101 + s\_0341 \xrightleftharpoons{e\_0611,\ e\_0609,\ s\_1101,\ s\_0341,\ s\_0343,\ s\_0620,\ s\_1095} s\_0343 + s\_0620 + s\_1095$	0000176
206	r_0785	imidazoleglycerol-phosphate dehydratase	$s\_0620 \xrightleftharpoons{e\_0608,\ s\_0620,\ s\_0263} s\_0263$	0000176
207	r_0786	IMP cyclohydrolase	$s\_0352 \xrightleftharpoons{e\_1258,\ s\_0352,\ s\_1006} s\_1006$	0000176
208	r_0787	IMP dehydrogenase	$s\_1006 + s\_1333 \xrightleftharpoons{e\_0796,\ s\_1006,\ s\_1333,\ s\_1334,\ s\_1799} s\_1334 + s\_1799$	0000176
209	r_0788	indole-3-glycerol-phosphate synthase	$s\_0096 \xrightleftharpoons{e\_0427,\ s\_0096,\ s\_0493,\ s\_0543} s\_0493 + s\_0543$	0000176
210	r_0796	ISC [2Fe-2S] regeneration	$s\_0377 + s\_1018 + s\_1019 \xrightleftharpoons{e\_0805,\ e\_0804,\ s\_0377,\ s\_1018,\ s\_1019,\ s\_1017,\ s\_1020} s\_1017 + s\_1020$	0000176
211	r_0797	ISC [2Fe-2S] Synthesis	$s\_0860 + 2\,s\_0838 + 2\,s\_1018 + s\_1019 \xrightleftharpoons{e\_0804,\ e\_1188,\ e\_0805,\ s\_0860,\ s\_0838,\ s\_1018,\ s\_1019,\ s\_0859,\ s\_1017,\ s\_1} 2\,s\_1017 + s\_1020$	0000176
212	r_0798	ISC [2Fe-2S] Synthesis II	$s\_0860 + 2\,s\_0838 + 2\,s\_1018 + s\_1020 \xrightleftharpoons{e\_0804,\ e\_1188,\ e\_0805,\ s\_0860,\ s\_0838,\ s\_1018,\ s\_1020,\ s\_0859,\ s\_1017,\ s\_1} 2\,s\_1017 + s\_1022$	0000176
213	r_0799	ISC [2Fe-2S] Transfer	$s\_1020 \xrightleftharpoons{e\_0803,\ e\_0804,\ s\_1020,\ s\_0378,\ s\_1019} s\_0378 + s\_1019$	0000176
214	r_0800	ISC [4Fe-4S] Reduction	$s\_0860 + s\_1022 \xrightleftharpoons{e\_0804,\ s\_0860,\ s\_1022,\ s\_0859,\ s\_1021} s\_0859 + s\_1021$	0000176

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215	r_0801	ISC [4Fe-4S] Transfer	s_1021 $\xrightleftharpoons{\text{e_0803, e_0804, s_1021, s_0380, s_1019}}$ s_0380 + s_1019	0000176
216	r_0802	ISC Cysteine desulfuration	s_1083 + s_1017 $\xrightleftharpoons{\text{e_0805, s_1083, s_1017, s_1041, s_1018}}$ s_1041 + s_1018	0000176
217	r_0806	isocitrate dehydrogenase (NADP)	s_1027 + s_1335 $\xrightleftharpoons{\text{e_0391, s_1027, s_1335, s_0233, s_0543, s_1336}}$ s_0233 + s_0543 + s_1336	0000176
218	r_0808	isoleucine transaminase	s_0051 + s_1095 $\xrightleftharpoons{\text{e_1167, s_0051, s_1095, s_0233, s_1119}}$ s_0233 + s_1119	0000176
219	r_0811	ketol-acid reductoisomerase (2,3-dihydroxy-3-methylbutanoate)	s_0042 + s_1336 $\xrightleftharpoons{\text{e_1170, s_0042, s_1336, s_0017, s_1335}}$ s_0017 + s_1335	0000176
220	r_0812	ketol-acid reductoisomerase (2-Acetolactate)	s_0041 + s_1336 $\xrightleftharpoons{\text{e_1170, s_0041, s_1336, s_0018, s_1335}}$ s_0018 + s_1335	0000176
221	r_0815	L-alanine transaminase	s_1095 + s_1531 $\xrightleftharpoons{\text{e_0742, e_0717, s_1095, s_1531, s_0233, s_1041}}$ s_0233 + s_1041	0000176
222	r_0829	L-aspartate oxidase	s_1072 + s_1372 $\xrightleftharpoons{\text{e_0819, s_1072, s_1372, s_0991, s_1005}}$ s_0991 + s_1005	0000176
223	r_0835	L-glutamate 5-semialdehyde dehydratase (spontaneous)	s_1100 $\xrightleftharpoons{\text{s_1100, s_0128}}$ s_0128	0000176
224	r_0847	L-threonine deaminase	s_1179 $\xrightleftharpoons{\text{e_1169, e_0977, s_1179, s_0232, s_0451}}$ s_0232 + s_0451	0000176
225	r_0848	L-threonine dehydrogenase	s_1333 + s_1179 $\xrightleftharpoons{\text{e_1109, s_1333, s_1179, s_1040, s_1334}}$ s_1040 + s_1334	0000176

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226	r_0854	leucine transaminase (irreversible)	s_0328 + s_1095 $\xleftrightarrow{\text{e_1167, e_1276, s_0328, s_1095, s_0233, s_1127}}$ s_0233 + s_1127	0000176
227	r_0857	Lipid A disaccaride synthase	s_0149 + s_1734 $\xleftrightarrow{\text{e_0084, s_0149, s_1734, s_1204, s_1733}}$ s_1204 + s_1733	0000176
228	r_0925	malate dehydrogenase	s_1138 + s_1333 $\xleftrightarrow{\text{e_1004, s_1138, s_1333, s_1334, s_1399}}$ s_1334 + s_1399	0000176
229	r_0928	malate oxidase	s_0991 + s_1399 $\xleftrightarrow{\text{s_0991, s_1399, s_1138, s_1372}}$ s_1138 + s_1372	0000176
230	r_0934	Malonyl-CoA methyltransferase	s_1552 + s_1217 $\xleftrightarrow{\text{e_0277, s_1552, s_1217, s_1551, s_1218}}$ s_1551 + s_1218	0000176
231	r_0935	Malonyl-CoA-ACP transacylase	s_0397 + s_1217 $\xleftrightarrow{\text{e_0375, e_0373, s_0397, s_1217, s_0555, s_1216}}$ s_0555 + s_1216	0000176
232	r_0950	methenyltetrahydrofolate cyclohydrolase	s_0335 $\xleftrightarrow{\text{e_0188, s_0335, s_0133}}$ s_0133	0000176
233	r_0951	methionine adenosyltransferase	s_0467 + s_1141 $\xleftrightarrow{\text{e_0931, s_0467, s_1141, s_1552, s_1430, s_0783}}$ s_1552 + s_1430 + s_0783	0000176
234	r_0954	methionine synthase	s_0354 + s_1112 $\xleftrightarrow{\text{e_1196, e_1262, s_0354, s_1112, s_1141, s_0337}}$ s_1141 + s_0337	0000176
235	r_0957	methylenetetrahydrofolate dehydrogenase (NADP)	s_0336 + s_1335 $\xleftrightarrow{\text{e_0188, s_0336, s_1335, s_0335, s_1336}}$ s_0335 + s_1336	0000176
236	r_0963	MoaD sulfuration (nadh, assumed)	s_1018 + s_1258 + s_1334 $\xleftrightarrow{\text{e_0281, e_0805, s_1018, s_1258, s_1334, s_0454, s_1017, s_1260, s_1333}}$ s_0454 + s_1017 + s_1260 + s_1333	0000176

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237	r_0964	molybdenum cofactor synthase	s_1261 + s_0420 $\xrightleftharpoons{\text{e_0292, s_1261, s_0420, s_0454, s_0579, s_1264}}$ s_0454 + s_0579 + s_1264	0000176
238	r_0965	molybdopterin adenylyltransferase	s_0467 + s_1265 $\xrightleftharpoons{\text{e_0006, s_0467, s_1265, s_0420, s_0783}}$ s_0420 + s_0783	0000176
239	r_0968	molybdopterin synthase	s_0585 + s_0579 + 2 s_1260 $\xrightleftharpoons{\text{e_0281, e_0282, s_0585, s_0579, s_1260, s_1259, s_1265}}$ 2 s_1259 + s_1265	0000176
240	r_0969	molybdopterin synthase sulfurylase	s_0467 + s_1259 $\xrightleftharpoons{\text{e_0291, s_0467, s_1259, s_1258, s_0783}}$ s_1258 + s_0783	0000176
241	r_0970	murein crosslinking transpeptidase 1A:(A2pm->D-ala) (periplasm)	s_1725 $\xrightleftharpoons{\text{e_0036, e_1029, e_0221, e_0065, s_1725, s_0600, s_1719}}$ s_0600 + s_1719	0000176
242	r_0996	N-acetyl-g-glutamyl-phosphate reductase	s_1304 + s_1336 $\xrightleftharpoons{\text{e_1242, s_1304, s_1336, s_1303, s_1335, s_1430}}$ s_1303 + s_1335 + s_1430	0000176
243	r_0999	N-acetylglutamate synthase	s_0395 + s_1095 $\xrightleftharpoons{\text{e_0893, s_0395, s_1095, s_1302, s_0555}}$ s_1302 + s_0555	0000176
244	r_1006	NAD kinase	s_0467 + s_1333 $\xrightleftharpoons{\text{e_0828, s_0467, s_1333, s_0421, s_1335}}$ s_0421 + s_1335	0000176
245	r_1008	NAD synthase (nh3)	s_0467 + s_0732 + s_0451 $\xrightleftharpoons{\text{e_0554, s_0467, s_0732, s_0451, s_0454, s_1333, s_0783}}$ s_0454 + s_1333 + s_0783	0000176
246	r_1019	nicotinate-nucleotide adenylyltransferase	s_0467 + s_1340 $\xrightleftharpoons{\text{e_0223, s_0467, s_1340, s_0732, s_0783}}$ s_0732 + s_0783	0000176
247	r_1021	nicotinate-nucleotide diphosphorylase (carboxylating)	s_0360 + s_1537 $\xrightleftharpoons{\text{e_0048, s_0360, s_1537, s_0543, s_1340, s_0783}}$ s_0543 + s_1340 + s_0783	0000176

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248	r_1039	nucleoside-diphosphate kinase (ATP:CDP)	s_0467 + s_0510 $\overset{\text{e_0799, e_0167, s_0467, s_0510, s_0421, s_0575}}{\rightleftharpoons}$ s_0421 + s_0575	0000176
249	r_1043	nucleoside-diphosphate kinase (ATP:dTDP)	s_0467 + s_0795 $\overset{\text{e_0799, e_0167, s_0467, s_0795, s_0421, s_0805}}{\rightleftharpoons}$ s_0421 + s_0805	0000176
250	r_1045	nucleoside-diphosphate kinase (ATP:GDP)	s_0467 + s_0896 $\overset{\text{e_0799, e_0167, s_0467, s_0896, s_0421, s_0945}}{\rightleftharpoons}$ s_0421 + s_0945	0000176
251	r_1046	nucleoside-diphosphate kinase (ATP:UDP)	s_0467 + s_1733 $\overset{\text{e_0799, e_0167, s_0467, s_1733, s_0421, s_1792}}{\rightleftharpoons}$ s_0421 + s_1792	0000176
252	r_1047	nucleoside-triphosphatase (ATP)	s_0467 $\overset{\text{e_1313, e_0225, s_0467, s_0421, s_1430}}{\rightleftharpoons}$ s_0421 + s_1430	0000176
253	r_1054	O-Phospho-4-hydroxy-L-threonine:2-oxoglutarate aminotransferase	s_1095 + s_0231 $\overset{\text{e_0326, s_1095, s_0231, s_0233, s_1362}}{\rightleftharpoons}$ s_0233 + s_1362	0000176
254	r_1057	O-succinylhomoserine lyase (L-cysteine)	s_1083 + s_1367 $\overset{\text{e_1232, s_1083, s_1367, s_1082, s_1595}}{\rightleftharpoons}$ s_1082 + s_1595	0000176
255	r_1063	Octaprenyl pyrophosphate synthase	s_0826 + 5 s_1028 $\overset{\text{e_0990, s_0826, s_1028, s_0435, s_0783}}{\rightleftharpoons}$ 5 s_0435 + 5 s_0783	0000176
256	r_1064	Octaprenyl-hydroxybenzoate decarboxylase	s_0283 $\overset{\text{e_0727, e_1200, s_0283, s_0229, s_0543}}{\rightleftharpoons}$ s_0229 + s_0543	0000176
257	r_1065	ornithine carbamoyltransferase	s_0502 + s_1391 $\overset{\text{e_1341, e_0103, s_0502, s_1391, s_1081, s_1430}}{\rightleftharpoons}$ s_1081 + s_1430	0000176
258	r_1067	orotate phosphoribosyltransferase	s_1394 + s_0360 $\overset{\text{e_1129, s_1394, s_0360, s_1397, s_0783}}{\rightleftharpoons}$ s_1397 + s_0783	0000176

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259	r_1068	orotidine-5'-phosphate decarboxylase	s_1397 $\xrightleftharpoons{\text{e\_0435, s\_1397, s\_0543, s\_1762}}$ s_0543 + s_1762	0000176
260	r_1074	pantetheine-phosphate adenylyltransferase	s_0467 + s_1413 $\xrightleftharpoons{\text{e\_1126, s\_0467, s\_1413, s\_0754, s\_0783}}$ s_0754 + s_0783	0000176
261	r_1075	pantothenate kinase	s_0467 + s_0033 $\xrightleftharpoons{\text{e\_1249, s\_0467, s\_0033, s\_0599, s\_0421}}$ s_0599 + s_0421	0000176
262	r_1076	pantothenate synthase	s_0470 + s_0467 + s_0032 $\xrightleftharpoons{\text{e\_0062, s\_0470, s\_0467, s\_0032, s\_0454, s\_0033, s\_0783}}$ s_0454 + s_0033 + s_0783	0000176
263	r_1081	phenylalanine transaminase	s_1095 + s_1429 $\xrightleftharpoons{\text{e\_1167, e\_1276, e\_0332, s\_1095, s\_1429, s\_0233, s\_1151}}$ s_0233 + s_1151	0000176
264	r_1123	Phosphatidylserine decarboxylase (n-C16:0)	s_1477 $\xrightleftharpoons{\text{e\_1312, s\_1477, s\_0543, s\_1437}}$ s_0543 + s_1437	0000176
265	r_1124	Phosphatidylserine decarboxylase (n-C16:1)	s_1476 $\xrightleftharpoons{\text{e\_1312, s\_1476, s\_0543, s\_1435}}$ s_0543 + s_1435	0000176
266	r_1130	Phosphatidylserine syntase (n-C16:0)	s_0513 + s_1170 $\xrightleftharpoons{\text{e\_0823, s\_0513, s\_1170, s\_0539, s\_1477}}$ s_0539 + s_1477	0000176
267	r_1131	Phosphatidylserine syntase (n-C16:1)	s_0512 + s_1170 $\xrightleftharpoons{\text{e\_0823, s\_0512, s\_1170, s\_0539, s\_1476}}$ s_0539 + s_1476	0000176
268	r_1134	phospho-L-serine phosphatase (periplasmic)	s_1364 $\xrightleftharpoons{\text{e\_1277, e\_1369, s\_1364, s\_1430, s\_1170}}$ s_1430 + s_1170	0000176
269	r_1137	phospho-N-acetylmuramoyl-pentapeptide-transferase (meso-2,6-diaminopimelate)	s_1768 + s_1755 $\xrightleftharpoons{\text{e\_0039, s\_1768, s\_1755, s\_1777, s\_1762}}$ s_1777 + s_1762	0000176

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270	r_1139	phosphoadenylyl-sulfate reductase (thioredoxin)	s_0252 + s_1544 $\rightleftharpoons$ (e_0871, e_1172, e_0822, s_0252, s_1544, s_0411, s_1612, s_1406) s_0 + s_1612 + s_1406	0000176
271	r_1141	phosphoenolpyruvate carboxylase	s_0543 + s_1484 $\rightleftharpoons$ (e_1240, s_0543, s_1484, s_1399, s_1430) s_1399 + s_1430	0000176
272	r_1150	phosphoglucosamine mutase	s_0654 $\rightleftharpoons$ (e_0987, s_0654, s_0653) s_0653	0000176
273	r_1151	phosphoglycerate dehydrogenase	s_0306 + s_1333 $\rightleftharpoons$ (e_0918, s_0306, s_1333, s_0308, s_1334) s_0308 + s_1334	0000176
274	r_1152	phosphoglycerate kinase	s_0307 + s_0421 $\rightleftharpoons$ (e_0925, s_0307, s_0421, s_0306, s_0467) s_0306 + s_0467	0000176
275	r_1153	phosphoglycerate mutase	s_0306 $\rightleftharpoons$ (e_1108, e_1373, e_0264, s_0306, s_0675) s_0675	0000176
276	r_1198	phosphomethylpyrimidine kinase	s_0313 + s_0467 $\rightleftharpoons$ (e_0641, s_0313, s_0467, s_0218, s_0421) s_0218 + s_0421	0000176
277	r_1200	phosphopantothenate-cysteine ligase	s_0599 + s_0575 + s_1083 $\rightleftharpoons$ (e_1127, s_0599, s_0575, s_1083, s_1277, s_0539, s_0783) s_1277 + s_0539 + s_0783	0000176
278	r_1201	phosphopantothenoylcysteine decarboxylase	s_1277 $\rightleftharpoons$ (e_1127, s_1277, s_0543, s_1413) s_0543 + s_1413	0000176
279	r_1202	phosphopentomutase	s_0446 $\rightleftharpoons$ (e_1023, e_1366, s_0446, s_0445) s_0445	0000176
280	r_1204	phosphoribosyl-AMP cyclohydrolase	s_0098 $\rightleftharpoons$ (e_0612, s_0098, s_0097) s_0097	0000176
281	r_1205	phosphoribosyl-ATP pyrophosphatase	s_0099 $\rightleftharpoons$ (e_0612, s_0099, s_0783, s_0098) s_0783 + s_0098	0000176

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282	r_1206	phosphoribosylaminoimidazole carboxylase	s_0342 + s_0467 + s_0474 $\overset{\text{e_0184, s_0342, s_0467, s_0474, s_0362, s_0421, s_1430}}{\rightleftharpoons}$ s_0362 + s_0421 + s_1430	0000176
283	r_1207	phosphoribosylaminoimidazole carboxylase (mutase rxn)	s_0362 $\overset{\text{e_0185, s_0362, s_0344}}{\rightleftharpoons}$ s_0344	0000176
284	r_1208	phosphoribosylaminoimidazole synthase	s_0467 + s_0162 $\overset{\text{e_0791, s_0467, s_0162, s_0421, s_0342, s_1430}}{\rightleftharpoons}$ s_0421 + s_0342 + s_1430	0000176
285	r_1209	phosphoribosylaminoimidazolecarboxamide formyltransferase	s_0133 + s_0343 $\overset{\text{e_1258, s_0133, s_0343, s_0352, s_0337}}{\rightleftharpoons}$ s_0352 + s_0337	0000175
286	r_1210	phosphoribosylaminoimidazolesuccinocarboxamide synthase	s_0344 + s_1072 + s_0467 $\overset{\text{e_0775, s_0344, s_1072, s_0467, s_0040, s_0421, s_1430}}{\rightleftharpoons}$ s_0040 + s_0421 + s_1430	0000176
287	r_1211	phosphoribosylanthranilate isomerase (irreversible)	s_1278 $\overset{\text{e_0427, s_1278, s_0096}}{\rightleftharpoons}$ s_0096	0000176
288	r_1212	phosphoribosylformylglycinamidine synthase	s_0467 + s_1322 + s_1101 $\overset{\text{e_0815, s_0467, s_1322, s_1101, s_0421, s_0162, s_1095, s_1430}}{\rightleftharpoons}$ s_0421 + s_0162 + s_1095 + s_1430	0000176
289	r_1214	phosphoribosylglycinamide synthase	s_0467 + s_0929 + s_0361 $\overset{\text{e_1257, s_0467, s_0929, s_0361, s_0421, s_1318, s_1430}}{\rightleftharpoons}$ s_0421 + s_1318 + s_1430	0000176
290	r_1215	phosphoribosylpyrophosphate synthetase	s_0467 + s_0446 $\overset{\text{e_0403, s_0467, s_0446, s_0454, s_0360}}{\rightleftharpoons}$ s_0454 + s_0360	0000176
291	r_1217	phosphoserine transaminase	s_0308 + s_1095 $\overset{\text{e_0326, s_0308, s_1095, s_0233, s_1364}}{\rightleftharpoons}$ s_0233 + s_1364	0000176

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292	r_1218	phosphotransacetylase	$s\_0393 + s\_0555 \xleftrightarrows{e\_0768,\ e\_0720,\ s\_0393,\ s\_0555,\ s\_0395,\ s\_1430} s\_0395 + s\_1430$	0000176
293	r_1220	Pimeloyl-[ACP] methyl ester esterase	$s\_1492 \xleftrightarrows{e\_1034,\ s\_1492,\ s\_1248,\ s\_1491} s\_1248 + s\_1491$	0000176
294	r_1222	polyphosphate kinase	$s\_0421 + s\_0783 \xleftrightarrows{e\_0793,\ s\_0421,\ s\_0783,\ s\_0467,\ s\_1430} s\_0467 + s\_1430$	0000176
295	r_1223	porphobilinogen synthase	$2\, s\_0345 \xleftrightarrows{e\_0134,\ s\_0345,\ s\_1493} s\_1493$	0000176
296	r_1224	prephenate dehydratase	$s\_1497 \xleftrightarrows{e\_0825,\ s\_1497,\ s\_0543,\ s\_1429} s\_0543 + s\_1429$	0000176
297	r_1225	prephenate dehydrogenase	$s\_1333 + s\_1497 \xleftrightarrows{e\_0826,\ s\_1333,\ s\_1497,\ s\_0262,\ s\_0543,\ s\_1334} s\_0262 + s\_0543 + s\_1334$	0000176
298	r_1230	protoporphyrinogen oxidase (aerobic)	$1 \cdot 5\, s\_1372 + s\_1512 \xleftrightarrows{e\_1205,\ s\_1372,\ s\_1512,\ s\_1511} s\_1511$	0000176
299	r_1232	purine-nucleoside phosphorylase (Adenosine)	$s\_0405 + s\_0445 \xleftrightarrows{e\_1367,\ s\_0405,\ s\_0445,\ s\_0408,\ s\_1430} s\_0408 + s\_1430$	0000176
300	r_1245	Pyridoxine 5'-phosphate synthase	$s\_0116 + s\_1333 + s\_1362 \xleftrightarrows{e\_0818,\ e\_0022,\ s\_0116,\ s\_1333,\ s\_1362,\ s\_0543,\ s\_1334,\ s\_1530,\ s\_1430} s\_05 s\_1334 + s\_1530 + s\_1430$	0000176
301	r_1250	pyrroline-5-carboxylate reductase	$s\_0128 + s\_1336 \xleftrightarrows{e\_0137,\ s\_0128,\ s\_1336,\ s\_1335,\ s\_1155} s\_1335 + s\_1155$	0000176
302	r_1251	pyruvate dehydrogenase	$s\_0555 + s\_1333 + s\_1531 \xleftrightarrows{e\_0052,\ e\_0051,\ e\_0053,\ s\_0555,\ s\_1333,\ s\_1531,\ s\_0395,\ s\_0543,\ s\_1334} s\_03 s\_0543 + s\_1334$	0000176

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303	r_1252	pyruvate formate lyase	$s\_0555 + s\_1531 \xrightleftharpoons{e\_0974,\ e\_1238,\ e\_1239,\ e\_0323,\ e\_0324,\ e\_0821,\ s\_0555,\ s\_1531,\ s\_0} s\_0867$	0000176
304	r_1255	pyruvate synthase	$s\_0555 + 2\,s\_0862 + s\_1531 \xrightleftharpoons{e\_0451,\ e\_0238,\ e\_0911,\ s\_0555,\ s\_0862,\ s\_1531,\ s\_0395,\ s\_0543,\ s\_0861} s\_03 s\_0543 + 2\,s\_0861$	0000176
305	r_1259	quinolinate synthase	$s\_0772 + s\_1005 \xrightleftharpoons{e\_0260,\ s\_0772,\ s\_1005,\ s\_1430,\ s\_1537} s\_1537$	0000176
306	r_1264	riboflavin kinase	$s\_0467 + s\_1546 \xrightleftharpoons{e\_0008,\ s\_0467,\ s\_1546,\ s\_0421,\ s\_0863} s\_0863$	0000176
307	r_1265	riboflavin synthase	$s\_0311 + s\_0255 \xrightleftharpoons{e\_0531,\ s\_0311,\ s\_0255,\ s\_0364,\ s\_1430} s\_1430$	0000176
308	r_1266	riboflavin synthase	$2\,s\_0364 \xrightleftharpoons{e\_0145,\ s\_0364,\ s\_0311,\ s\_1546} s\_0311 + s\_1546$	0000176
309	r_1276	ribonucleoside-triphosphate reductase (ATP) (flavodoxin)	$s\_0467 + 2\,s\_0861 \xrightleftharpoons{e\_1335,\ e\_1227,\ e\_1334,\ e\_0238,\ e\_0911,\ s\_0467,\ s\_0861,\ s\_0726,\ s} 2\,s\_0862$	0000176
310	r_1277	ribonucleoside-triphosphate reductase (CTP) (flavodoxin)	$s\_0575 + 2\,s\_0861 \xrightleftharpoons{e\_1335,\ e\_1227,\ e\_1334,\ e\_0238,\ e\_0911,\ s\_0575,\ s\_0861,\ s\_0731,\ s} 2\,s\_0862$	0000176
311	r_1278	ribonucleoside-triphosphate reductase (GTP) (flavodoxin)	$2\,s\_0861 + s\_0945 \xrightleftharpoons{e\_1335,\ e\_1227,\ e\_1334,\ e\_0238,\ e\_0911,\ s\_0861,\ s\_0945,\ s\_0760,\ s} 2\,s\_0862$	0000176
312	r_1279	ribonucleoside-triphosphate reductase (UTP) (flavodoxin)	$2\,s\_0861 + s\_1792 \xrightleftharpoons{e\_1335,\ e\_1227,\ e\_1334,\ e\_0238,\ e\_0911,\ s\_0861,\ s\_1792,\ s\_0810,\ s} 2\,s\_0862$	0000176
313	r_1284	ribose-5-phosphate isomerase	$s\_0704 \xrightleftharpoons{e\_0919,\ e\_1291,\ s\_0704,\ s\_0446} s\_0446$	0000176
314	r_1285	ribulose 5-phosphate 3-epimerase	$s\_0721 \xrightleftharpoons{e\_1355,\ e\_1026,\ s\_0721,\ s\_0704} s\_0704$	0000176

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315	r_1288	S-adenosylhomocysteine nucleosidase	s_1551 $\xrightleftharpoons{\text{e\_0074, s\_1551, s\_0405, s\_1558}}$ s_0405 + s_1558	0000176
316	r_1291	S-ribosylhomocysteine cleavage enzyme	s_1558 $\xrightleftharpoons{\text{e\_0839, s\_1558, s\_0310, s\_1112}}$ s_0310 + s_1112	0000176
317	r_1301	serine O-acetyltransferase	s_0395 + s_1170 $\xrightleftharpoons{\text{e\_1105, s\_0395, s\_1170, s\_1358, s\_0555}}$ s_1358 + s_0555	0000176
318	r_1304	shikimate dehydrogenase	s_0270 + s_1336 $\xrightleftharpoons{\text{e\_1010, e\_0540, s\_0270, s\_1336, s\_1335, s\_1571}}$ s_1335 + s_1571	0000176
319	r_1305	shikimate kinase	s_0467 + s_1571 $\xrightleftharpoons{\text{e\_1028, e\_0138, s\_0467, s\_1571, s\_0421, s\_1574}}$ s_0421 + s_1574	0000176
320	r_1306	sirohydrochlorin dehydrogenase (NAD)	s_0768 + s_1333 $\xrightleftharpoons{\text{e\_1019, s\_0768, s\_1333, s\_1334, s\_1578}}$ s_1334 + s_1578	0000176
321	r_1307	sirohydrochlorin ferrochelatase	s_0838 + s_1578 $\xrightleftharpoons{\text{e\_1019, s\_0838, s\_1578, s\_1577}}$ s_1577	0000176
322	r_1315	succinyl-CoA synthetase (ADP-forming)	s_0467 + s_0555 + s_1595 $\xrightleftharpoons{\text{e\_0253, e\_0254, s\_0467, s\_0555, s\_1595, s\_0421, s\_1430, s\_1599}}$ s_0421 + s_1430 + s_1599	0000176
323	r_1316	succinyl-diaminopimelate desuccinylase	s_1316 $\xrightleftharpoons{\text{e\_0774, s\_1316, s\_1211, s\_1595}}$ s_1211 + s_1595	0000176
324	r_1318	succinyldiaminopimelate transaminase	s_1095 + s_1315 $\xrightleftharpoons{\text{e\_1014, s\_1095, s\_1315, s\_0233, s\_1316}}$ s_0233 + s_1316	0000176
325	r_1329	Sulfate adenyltransferase	s_0467 + s_0945 + s_1609 $\xrightleftharpoons{\text{e\_0869, e\_0870, s\_0467, s\_0945, s\_1609, s\_0412, s\_0896, s\_1430, s\_0783}}$ s_0412 + s_0896 + s_1430 + s_0783	0000176

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326	r_1330	sulfite reductase (NADPH2)	$3\,s\_1336 + s\_1612 \xrightleftharpoons{e\_0872,\ e\_0873,\ s\_1336,\ s\_1612,\ s\_0994,\ s\_1335} s\_0994 + 3\,s\_1335$	0000176
327	r_1335	tartronate semialdehyde reductase	$s\_0214 + s\_1334 \xrightleftharpoons{e\_0979,\ e\_0177,\ s\_0214,\ s\_1334,\ s\_0029,\ s\_1333} s\_0029 + s\_1333$	0000176
328	r_1337	Tetraacyldisaccharide 4'kinase	$s\_0467 + s\_1204 \xrightleftharpoons{e\_0330,\ s\_0467,\ s\_1204,\ s\_0421,\ s\_0147} s\_0421 + s\_0147$	0000176
329	r_1338	tetrahydrodipicolinate succinylase	$s\_1599 + s\_0148 \xrightleftharpoons{e\_0076,\ s\_1599,\ s\_0148,\ s\_0555,\ s\_1315} s\_0555 + s\_1315$	0000176
330	r_1344	thiamine-phosphate diphosphorylase	$s\_0218 + s\_0330 \xrightleftharpoons{e\_1253,\ s\_0218,\ s\_0330,\ s\_0783,\ s\_1643} s\_0783 + s\_1643$	0000176
331	r_1345	thiamine-phosphate kinase	$s\_0467 + s\_1643 \xrightleftharpoons{e\_0146,\ s\_0467,\ s\_1643,\ s\_0421,\ s\_1644} s\_0421 + s\_1644$	0000176
332	r_1346	thiazole phosphate synthesis	$s\_0467 + s\_0738 + s\_0116 + s\_1018 + s\_1336 \xrightleftharpoons{e\_1374,\ e\_1250,\ e\_0805,\ e\_0151,\ e\_1252,\ s\_0467,\ s\_0738,\ s\_0116,\ s\_1018,\ s\_1} s\_0454 + s\_0543 + s\_1017 + s\_1335 + s\_0783$	0000176
333	r_1347	thioredoxin reductase (NADPH)	$s\_1336 + s\_1406 \xrightleftharpoons{e\_1172,\ e\_0822,\ e\_0318,\ s\_1336,\ s\_1406,\ s\_1335,\ s\_1544} s\_1335 + s\_1544$	0000176
334	r_1348	Threonine aldolase	$s\_1179 \xrightleftharpoons{e\_0313,\ e\_0813,\ s\_1179,\ s\_0381,\ s\_0929} s\_0381 + s\_0929$	0000176
335	r_1349	threonine synthase	$s\_1363 \xrightleftharpoons{e\_0003,\ s\_1363,\ s\_1430,\ s\_1179} s\_1430 + s\_1179$	0000176
336	r_1353	thymidylate synthase	$s\_0807 + s\_0336 \xrightleftharpoons{e\_0894,\ s\_0807,\ s\_0336,\ s\_0372,\ s\_0802} s\_0372 + s\_0802$	0000176

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337	r_1356	transaldolase	s_0621 + s_0627 $\xrightleftharpoons{\text{e_0770, e_0005, s_0621, s_0627, s_0913, s_1561}}$ s_0913 + s_1561	0000176
338	r_1357	transketolase	s_0913 + s_1561 $\xrightleftharpoons{\text{e_0771, e_0928, s_0913, s_1561, s_0446, s_0721}}$ s_0446 + s_0721	0000176
339	r_1358	transketolase	s_0627 + s_0913 $\xrightleftharpoons{\text{e_0771, e_0928, s_0627, s_0913, s_0621, s_0721}}$ s_0621 + s_0721	0000176
340	r_1363	triose-phosphate isomerase	s_0913 $\xrightleftharpoons{\text{e_1226, s_0913, s_0772}}$ s_0772	0000176
341	r_1367	tryptophan synthase (indoleglycerol phosphate)	s_0493 $\xrightleftharpoons{\text{e_0425, e_0426, s_0493, s_0913, s_1009}}$ s_0913 + s_1009	0000176
342	r_1368	Tryptophanase (L-tryptophan)	s_1009 + s_0451 + s_1531 $\xrightleftharpoons{\text{e_1141, s_1009, s_0451, s_1531, s_1185}}$ s_1185	0000176
343	r_1375	tyrosine lyase	s_1552 + s_1336 + s_1189 $\xrightleftharpoons{\text{e_1251, s_1552, s_1336, s_1189, s_1407, s_0333, s_0738, s_1141, s_1335}}$ s_140 s_0333 + s_0738 + s_1141 + s_1335	0000176
344	r_1376	tyrosine transaminase	s_0262 + s_1095 $\xrightleftharpoons{\text{e_1276, e_0332, s_0262, s_1095, s_0233, s_1189}}$ s_0233 + s_1189	0000176
345	r_1378	UDP-3-O-(3-hydroxymyristoyl)glucosamine acyltransferase	s_0028 + s_1735 $\xrightleftharpoons{\text{e_0081, s_0028, s_1735, s_0397, s_1734}}$ s_0397 + s_1734	0000176
346	r_1379	UDP-3-O-acetylglucosamine deacetylase	s_1736 $\xrightleftharpoons{\text{e_0044, s_1736, s_0384, s_1735}}$ s_0384 + s_1735	0000176
347	r_1388	UDP-N-acetylenolpyruvoylglucosamine reductase	s_1336 + s_1742 $\xrightleftharpoons{\text{e_1248, s_1336, s_1742, s_1335, s_1750}}$ s_1335 + s_1750	0000176

№	Id	Name	Reaction Equation	SBO
348	r_1389	UDP-N-acetylglucosamine 1-carboxyvinyltransferase	s_1484 + s_1745 $\xrightleftharpoons{\text{e_0991, s_1484, s_1745, s_1430, s_1742}}$ s_1750 + s_1742	0000176
349	r_1391	UDP-N-acetylglucosamine acyltransferase	s_0028 + s_1745 $\xrightleftharpoons{\text{e_0375, e_0083, s_0028, s_1745, s_0397, s_1736}}$ s_0397 + s_1736	0000176
350	r_1392	UDP-N-acetylglucosamine diphosphorylase	s_1287 + s_1792 $\xrightleftharpoons{\text{e_1150, s_1287, s_1792, s_0783, s_1745}}$ s_0783 + s_1745	0000176
351	r_1393	UDP-N-acetylglucosamine-N-acetylmuramyl-(pentapeptide)pyrophosphoryl-undecaprenol N-acetylglucosamine transferase	s_1745 + s_1777 $\xrightleftharpoons{\text{e_0041, s_1745, s_1777, s_1776, s_1733}}$ s_1776 + s_1733	0000176
352	r_1397	UDP-N-acetylmuramoyl-L-alanine synthetase	s_1041 + s_0467 + s_1750 $\xrightleftharpoons{\text{e_0042, s_1041, s_0467, s_1750, s_0421, s_1430, s_1751}}$ s_0421 + s_1430 + s_1751	0000176
353	r_1399	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate synthetase	s_0467 + s_0671 + s_1751 $\xrightleftharpoons{\text{e_0040, s_0467, s_0671, s_1751, s_0421, s_1430, s_1754}}$ s_0421 + s_1430 + s_1754	0000176
354	r_1400	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimelate synthetase	s_1242 + s_0467 + s_1754 $\xrightleftharpoons{\text{e_0037, s_1242, s_0467, s_1754, s_0421, s_1430, s_1752}}$ s_0421 + s_1430 + s_1752	0000176
355	r_1401	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine synthetase	s_0603 + s_0467 + s_1752 $\xrightleftharpoons{\text{e_0038, s_0603, s_0467, s_1752, s_0421, s_1430, s_1755}}$ s_0421 + s_1430 + s_1755	0000176
356	r_1402	UDP-sugar hydrolase	s_1734 $\xrightleftharpoons{\text{e_0186, s_1734, s_0149, s_1762}}$ s_0149 + s_1762	0000176

№	Id	Name	Reaction Equation	SBO
357	r_1409	UMP kinase	s_0467 + s_1762 $\overset{\text{e_0328, e_0077, s_0467, s_1762, s_0421, s_1733}}{\rightleftharpoons}$ s_0421 + s_1733	0000176
358	r_1410	Undecaprenyl diphosphate synthase	s_0826 + 8 s_1028 $\overset{\text{e_0079, s_0826, s_1028, s_0783, s_1765}}{\rightleftharpoons}$ 8 s_0783 + s_1765	0000176
359	r_1413	undecaprenyl-diphosphatase	s_1765 $\overset{\text{e_0962, e_0433, e_0300, s_1765, s_1430, s_1768}}{\rightleftharpoons}$ s_1430 + s_1768	0000176
360	r_1421	uroporphyrinogen decarboxylase (uroporphyrinogen III)	s_1791 $\overset{\text{e_1256, s_1791, s_0543, s_0565}}{\rightleftharpoons}$ 4 s_0543 + s_0565	0000176
361	r_1422	uroporphyrinogen methyltransferase	2 s_1552 + s_1791 $\overset{\text{e_1184, e_1019, s_1552, s_1791, s_1551, s_0768}}{\rightleftharpoons}$ 2 s_1551 + s_0768	0000176
362	r_1423	uroporphyrinogen-III synthase	s_0998 $\overset{\text{e_1185, s_0998, s_1791}}{\rightleftharpoons}$ s_1791	0000176
363	r_1425	valine transaminase	s_0282 + s_1095 $\overset{\text{e_1167, s_0282, s_1095, s_0233, s_1193}}{\rightleftharpoons}$ s_0233 + s_1193	0000176
364	r_1432	xylose isomerase	s_0657 $\overset{\text{e_1086, s_0657, s_0622}}{\rightleftharpoons}$ s_0622	0000176
365	r_1511	ammonia transport via diffusion (extracellular to periplasm)	s_0453 $\overset{\text{s_0453, s_0451}}{\rightleftharpoons}$ s_0451	0000185
366	r_1521	ATP synthase (four protons for one ATP) (periplasm)	s_0421 + s_1430 $\overset{\text{s_0421, s_1430, s_0467}}{\rightleftharpoons}$ s_0467	0000176
367	r_1536	calcium (Ca+2) transport via diffusion (extracellular to periplasm)	s_0499 $\overset{\text{s_0499, s_0497}}{\rightleftharpoons}$ s_0497	0000185
368	r_1543	chloride (Cl-1) transport via diffusion (extracellular to periplasm)	s_0522 $\overset{\text{s_0522, s_0520}}{\rightleftharpoons}$ s_0520	0000185

№	Id	Name	Reaction Equation	SBO
369	r_1551	CO2 transport via diffusion (extracellular to periplasm)	$\mathrm{s\_0543} \xrightarrow{\mathrm{s\_0543}} \mathrm{s\_0545}$	0000185
370	r_1557	cobalt (Co+2) transport via diffusion (extracellular to periplasm)	$\mathrm{s\_0548} \xrightleftharpoons{\mathrm{s\_0548,\ s\_0546}} \mathrm{s\_0546}$	0000185
371	r_1565	copper (Cu+2) transport via diffusion (extracellular to periplasm)	$\mathrm{s\_0581} \xrightleftharpoons{\mathrm{s\_0581,\ s\_0579}} \mathrm{s\_0579}$	0000185
372	r_1581	cytochrome oxidase bd (menaquinol-8: 2 protons) (periplasm)	$\mathrm{s\_1239} + 0 \cdot 5\,\mathrm{s\_1372} \xrightleftharpoons{\mathrm{s\_1239,\ s\_1372,\ s\_1240}} \mathrm{s\_1240}$	0000176
373	r_1582	cytochrome oxidase bd (ubiquinol-8: 2 protons) (periplasm)	$0 \cdot 5\,\mathrm{s\_1372} + \mathrm{s\_1731} \xrightleftharpoons{\mathrm{s\_1372,\ s\_1731,\ s\_1732}} \mathrm{s\_1732}$	0000176
374	r_1621	D-glucose transport via diffusion (extracellular to periplasm) irreversible	$\mathrm{s\_0659} \xrightleftharpoons{\mathrm{s\_0659,\ s\_0657}} \mathrm{s\_0657}$	0000185
375	r_1622	D-glucose transport via PEP:Pyr PTS (periplasm)	$\mathrm{s\_1484} + \mathrm{s\_0657} \xrightleftharpoons{\mathrm{s\_1484,\ s\_0657,\ s\_0663,\ s\_1531}} \mathrm{s\_0663} + \mathrm{s\_1531}$	0000176
376	r_1714	Fructose transport via PEP:Pyr PTS (f6p generating) (periplasm)	$\mathrm{s\_1484} + \mathrm{s\_0622} \xrightleftharpoons{\mathrm{s\_1484,\ s\_0622,\ s\_0627,\ s\_1531}} \mathrm{s\_0627} + \mathrm{s\_1531}$	0000176
377	r_1792	iron (II) transport via diffusion (extracellular to periplasm)	$\mathrm{s\_0840} \xrightleftharpoons{\mathrm{s\_0840,\ s\_0838}} \mathrm{s\_0838}$	0000185
378	r_1793	iron (III) transport via diffusion (extracellular to periplasm)	$\mathrm{s\_0843} \xrightleftharpoons{\mathrm{s\_0843,\ s\_0841}} \mathrm{s\_0841}$	0000185
379	r_1906	magnesium (Mg+2) transport via diffusion (extracellular to periplasm)	$\mathrm{s\_1214} \xrightleftharpoons{\mathrm{s\_1214,\ s\_1212}} \mathrm{s\_1212}$	0000185

№	Id	Name	Reaction Equation	SBO
380	r_1923	Manganese (Mn+2) transport via diffusion (extracellular to periplasm)	$s\_1257 \overset{s\_1257,\ s\_1255}{\rightleftharpoons} s\_1255$	0000185
381	r_1939	Methanol transport via diffusion (extracellular to periplasm)	$s\_1248 \overset{s\_1248}{\longrightarrow} s\_1250$	0000185
382	r_1943	molybdate transport via diffusion (extracellular to periplasm)	$s\_1263 \overset{s\_1263,\ s\_1261}{\rightleftharpoons} s\_1261$	0000185
383	r_1944	murein polymerizing transglycosylase	$2\,s\_1776 \overset{s\_1776,\ s\_1765,\ s\_1725}{\rightleftharpoons} 2\,s\_1765 + s\_1725$	0000176
384	r_1962	NAD(P) transhydrogenase (periplasm)	$s\_1334 + s\_1335 \overset{s\_1334,\ s\_1335,\ s\_1333,\ s\_1336}{\rightleftharpoons} s\_1330 + s\_1336$	0000176
385	r_1968	nickel transport via diffusion (extracellular to periplasm)	$s\_1331 \overset{s\_1331,\ s\_1329}{\rightleftharpoons} s\_1329$	0000185
386	r_2002	oxygen transport via diffusion (extracellular to periplasm)	$s\_1374 \overset{s\_1374,\ s\_1372}{\rightleftharpoons} s\_1372$	0000185
387	r_2011	phosphate transport via diffusion (extracellular to periplasm)	$s\_1432 \overset{s\_1432,\ s\_1430}{\rightleftharpoons} s\_1430$	0000185
388	r_2047	potassium transport via diffusion (extracellular to periplasm)	$s\_1496 \overset{s\_1496,\ s\_1494}{\rightleftharpoons} s\_1494$	0000185
389	r_2108	sulfate transport via diffusion (extracellular to periplasm)	$s\_1611 \overset{s\_1611,\ s\_1609}{\rightleftharpoons} s\_1609$	0000185
390	r_2167	zinc (Zn+2) transport via diffusion (extracellular to periplasm)	$s\_1806 \overset{s\_1806,\ s\_1804}{\rightleftharpoons} s\_1804$	0000185

№	Id	Name	Reaction Equation	SBO
391	r_2195	2-Octaprenylphenol hydroxylase (anaerobic)	$\text{s\_0229} + 2\,\text{s\_0467} + \text{s\_1333} \xrightleftharpoons{\text{s\_0229, s\_0467, s\_1333, s\_0226, s\_0421, s\_1334, s\_1430}} \text{s\_0226} + 2\,\text{s\_0421} + \text{s\_1334} + 2\,\text{s\_1430}$	0000176
392	r_2310	Dihydroneopterin monophosphate dephosphorylase	$\text{s\_0766} \xrightleftharpoons{\text{s\_0766, s\_0765, s\_1430}} \text{s\_0765} + \text{s\_1430}$	0000176
393	r_2519	pyridoxine 5'-phosphate oxidase (anaerboic	$\text{s\_1333} + \text{s\_1530} \xrightleftharpoons{\text{s\_1333, s\_1530, s\_1334, s\_1522}} \text{s\_1334} + \text{s\_1522}$	0000176
394	r_2521	pyrimidine phosphatase	$\text{s\_0346} \xrightleftharpoons{\text{s\_0346, s\_0311, s\_1430}} \text{s\_0311} + \text{s\_1430}$	0000176
395	r_2533	Sink needed to allow (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran to leave system	$\text{s\_0003} \xrightarrow{\text{s\_0003}} \text{s\_1807}$	0000185
396	r_2534	Sink needed to allow 5'-deoxyribose to leave system	$\text{s\_0334} \xrightarrow{\text{s\_0334}} \text{s\_1835}$	0000185
397	r_2537	Sink needed to allow p-Cresol to leave system	$\text{s\_1407} \xrightarrow{\text{s\_1407}} \text{s\_2072}$	0000185
398	r_2538	Sink needed to allow S-Adenosyl-4-methylthio-2-oxobutanoate to leave system	$\text{s\_1550} \xrightarrow{\text{s\_1550}} \text{s\_2093}$	0000185

№	Id	Name	Reaction Equation	SBO
399	r_2584	growth	$2.23 \cdot 10^{-4}$s_0133 + $2.6 \cdot 10^{-5}$s_0378 + $2.23 \cdot 10^{-4}$s_0226 + $2.6 \cdot 10^{-4}$s_0380 + 0 ·5137 s_1041 + $2.23 \cdot 10^{-4}$s_1552 + 0 ·2958 s_1061 + 0 ·2411 s_1068 + 0 ·2411 s_1072 + 54 ·12 s_0467 + $1.22 \cdot 10^{-4}$s_0480 + $2 \cdot 10^{-6}$s_0476 + 0 ·005205 s_0497 + 0 ·005205 s_0520 + $5.76 \cdot 10^{-4}$s_0555 + $2.5 \cdot 10^{-5}$s_0546 + 0 ·1335 s_0575 + $7.09 \cdot 10^{-4}$s_0579 + 0 ·09158 s_1083 + 0 ·02617 s_0726 + 0 ·02702 s_0731 + 0 ·02702 s_0760 + 0 ·02617 s_0805 + $2.23 \cdot 10^{-4}$s_0859 + 0 ·006715 s_0838 + 0 ·007808 s_0841 + 0 ·2632 s_1101 + 0 ·2632 s_1095 + 0 ·6126 s_0929 + 0 ·2151 s_0945 + 0 ·09474 s_1106 + 0 ·2905 s_1119 + 0 ·1952 s_1494 + 0 ·4505 s_1127 + 0 ·3432 s_1131 + 0 ·1537 s_1141 + 0 ·008675 s_1212 + $2.23 \cdot 10^{-4}$s_0336 + $6.91 \cdot 10^{-4}$s_1255 + $7 \cdot 10^{-6}$s_1261 + 0 ·001831 s_1333 + $4.47 \cdot 10^{-4}$s_1335 + 0 ·01301 s_0451 + $3.23 \cdot 10^{-4}$s_1329 + 0 ·06382 s_1437 + 0 ·07521 s_1435 + 0 ·1853 s_1151 + $2.23 \cdot 10^{-4}$s_1508 + 0 ·2211 s_1155 + $2.23 \cdot 10^{-4}$s_1522 + $2.23 \cdot 10^{-4}$s_1546 + 0 ·2158 s_1170 + $2.23 \cdot 10^{-4}$s_1577 + 0 ·004338 s_1609 + $2.23 \cdot 10^{-4}$s_0337 + $2.23 \cdot 10^{-4}$s_1644 + 0 ·2537 s_1179 + 0 ·05684 s_1185 + 0 ·1379 s_1189 + $5.5 \cdot 10^{-5}$s_1765 + 0 ·1441 s_1792 + 0 ·4232 s_1193 + $3.41 \cdot 10^{-4}$s_1804 + 0 ·01946 s_1033 + 0 ·01389 s_1719 $\xrightarrow{\text{s\_0133, s\_0378, s\_0226, s\_0380, s\_1041, s\_1552, s\_1061, s\_1068, s\_1}}$ 53 ·95 s_1430 + 0 ·7739 s_0783	

№	Id	Name	Reaction Equation	SBO

6.1 Reaction r_0001

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran synthesis (spontaneous)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0004} \xrightleftharpoons{\text{s\_0004, s\_0003}} \text{s\_0003} \tag{2}$$

Reactant

Table 5: Properties of each reactant.

Id	Name	SBO
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	

Modifiers

Table 6: Properties of each modifier.

Id	Name	SBO
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Product

Table 7: Properties of each product.

Id	Name	SBO
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Kinetic Law

Derived unit contains undeclared units

$$v_1 = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0004}] - \frac{[\text{s\_0003}]}{\text{Keq}} \right)}{\text{Km0004}}}{1 + \frac{[\text{s\_0004}]}{\text{Km0004}} + 1 + \frac{[\text{s\_0003}]}{\text{Km0003}} - 1} \tag{3}$$

Table 8: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.72332981485438 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0004		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0003		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.2 Reaction r_0008

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 1-(5-phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino)imidazole-4-carboxamide isomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0097} \xrightleftharpoons{\text{e\_0610, s\_0097, s\_0341}} \text{s\_0341} \tag{4}$$

Reactant

Table 9: Properties of each reactant.

Id	Name	SBO
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	

Modifiers

Table 10: Properties of each modifier.

Id	Name
e_0610	hisA
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxa

Product

Table 11: Properties of each product.

Id	Name
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxa

Kinetic Law

Derived unit contains undeclared units

$$v_2 = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0097}] - \frac{[\text{s\_0341}]}{\text{Keq}} \right)}{\text{Km0097}}}{1 + \frac{[\text{s\_0097}]}{\text{Km0097}} + 1 + \frac{[\text{s\_0341}]}{\text{Km0341}} - 1} \tag{5}$$

Table 12: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.079	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0097		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0341		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.3 Reaction r_0009

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-deoxy-D-xylulose 5-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0913} + \text{s\_1531} \xrightleftharpoons{\text{e\_0149, s\_0913, s\_1531, s\_0543, s\_0116}} \text{s\_0543} + \text{s\_0116} \tag{6}$$

Reactants

Table 13: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	

Modifiers

Table 14: Properties of each modifier.

Id	Name	SBO
e_0149	dxs	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	
s_0543	CO2	
s_0116	1-deoxy-D-xylulose 5-phosphate	

Products

Table 15: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_0116	1-deoxy-D-xylulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_3 = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0913}] \cdot [\mathrm{s\_1531}] - \frac{[\mathrm{s\_0543}] \cdot [\mathrm{s\_0116}]}{\mathrm{Keq}} \right)}{\mathrm{Km0913} \cdot \mathrm{Km1531}}}{\left(1 + \frac{[\mathrm{s\_0913}]}{\mathrm{Km0913}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1531}]}{\mathrm{Km1531}}\right) + \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0116}]}{\mathrm{Km0116}}\right) - 1} \tag{7}$$

Table 16: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.92694941408386 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.005	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0913		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1531		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0116		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.4 Reaction r_0011

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-deoxy-D-xylulose reductoisomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0116} + \text{s\_1336} \xrightleftharpoons{\text{e\_0078, s\_0116, s\_1336, s\_0194, s\_1335}} \text{s\_0194} + \text{s\_1335} \tag{8}$$

Reactants

Table 17: Properties of each reactant.

Id	Name	SBO
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 18: Properties of each modifier.

Id	Name	SBO
e_0078	dxr	0000460
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 19: Properties of each product.

Id	Name	SBO
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_4 = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0116}] \cdot [\text{s\_1336}] - \frac{[\text{s\_0194}] \cdot [\text{s\_1335}]}{\text{Keq}} \right)}{\text{Km0116} \cdot \text{Km1336}}}{\left(1 + \frac{[\text{s\_0116}]}{\text{Km0116}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) + \left(1 + \frac{[\text{s\_0194}]}{\text{Km0194}}\right) \cdot \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) - 1} \tag{9}$$

Table 20: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0116		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0194		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.5 Reaction r_0012

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hexadec-7-enoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0119} + \text{s\_0533} \xrightleftharpoons{\text{e\_0953, s\_0119, s\_0533, s\_0397, s\_0073}} \text{s\_0397} + \text{s\_0073} \tag{10}$$

Reactants

Table 21: Properties of each reactant.

Id	Name	SBO
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	

Modifiers

Table 22: Properties of each modifier.

Id	Name	SBO
e_0953	plsC	0000460

Id	Name	SBO
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0397	acyl carrier protein	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	

Products

Table 23: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_5 = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0119}] \cdot [\mathrm{s\_0533}] - \frac{[\mathrm{s\_0397}] \cdot [\mathrm{s\_0073}]}{\mathrm{Keq}} \right)}{\mathrm{Km0119} \cdot \mathrm{Km0533}}}{\left(1 + \frac{[\mathrm{s\_0119}]}{\mathrm{Km0119}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0533}]}{\mathrm{Km0533}}\right) + \left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0073}]}{\mathrm{Km0073}}\right) - 1} \tag{11}$$

Table 24: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	☑
Vmax		0000324	0.146	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0119		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0533		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0397		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0073		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.6 Reaction r_0013

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hexadecanoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0121} + \text{s\_1411} \xrightleftharpoons{\text{e\_0953, s\_0121, s\_1411, s\_0397, s\_0075}} \text{s\_0397} + \text{s\_0075} \tag{12}$$

Reactants

Table 25: Properties of each reactant.

Id	Name	SBO
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	

Modifiers

Table 26: Properties of each modifier.

Id	Name	SBO
e_0953	plsC	0000460
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0397	acyl carrier protein	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	

Products

Table 27: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_6 = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0121}] \cdot [\text{s\_1411}] - \frac{[\text{s\_0397}] \cdot [\text{s\_0075}]}{\text{Keq}} \right)}{\text{Km0121} \cdot \text{Km1411}}}{\left(1 + \frac{[\text{s\_0121}]}{\text{Km0121}}\right) \cdot \left(1 + \frac{[\text{s\_1411}]}{\text{Km1411}}\right) + \left(1 + \frac{[\text{s\_0397}]}{\text{Km0397}}\right) \cdot \left(1 + \frac{[\text{s\_0075}]}{\text{Km0075}}\right) - 1} \tag{13}$$

Table 28: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	☑
Vmax		0000324	0.124	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0121		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1411		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0397		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0075		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.7 Reaction r_0014

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate reductase (dmpp)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0123} + \mathrm{s\_1334} \xrightleftharpoons{\mathrm{e\_0010,\ s\_0123,\ s\_1334,\ s\_0779,\ s\_1333}} \mathrm{s\_0779} + \mathrm{s\_1333} \qquad (14)$$

Reactants

Table 29: Properties of each reactant.

Id	Name	SBO
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 30: Properties of each modifier.

Id	Name	SBO
e_0010	ispH	0000460
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0779	Dimethylallyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 31: Properties of each product.

Id	Name	SBO
s_0779	Dimethylallyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_7 = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0123}] \cdot [\text{s\_1334}] - \frac{[\text{s\_0779}] \cdot [\text{s\_1333}]}{\text{Keq}} \right)}{\text{Km0123} \cdot \text{Km1334}}}{\left(1 + \frac{[\text{s\_0123}]}{\text{Km0123}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) + \left(1 + \frac{[\text{s\_0779}]}{\text{Km0779}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) - 1} \tag{15}$$

Table 32: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.85076520790662 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$5.39107129106927 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0123		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0779		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.8 Reaction r_0015

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate reductase (ipdp)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0123} + \text{s\_1334} \xrightleftharpoons{\text{e\_0010, s\_0123, s\_1334, s\_1028, s\_1333}} \text{s\_1028} + \text{s\_1333} \tag{16}$$

Reactants

Table 33: Properties of each reactant.

Id	Name	SBO
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 34: Properties of each modifier.

Id	Name	SBO
e_0010	ispH	0000460
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1028	Isopentenyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 35: Properties of each product.

Id	Name	SBO
s_1028	Isopentenyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_8 = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0123}] \cdot [\mathrm{s\_1334}] - \frac{[\mathrm{s\_1028}] \cdot [\mathrm{s\_1333}]}{\mathrm{Keq}} \right)}{\mathrm{Km0123} \cdot \mathrm{Km1334}}}{\left(1 + \frac{[\mathrm{s\_0123}]}{\mathrm{Km0123}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) + \left(1 + \frac{[\mathrm{s\_1028}]}{\mathrm{Km1028}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) - 1} \tag{17}$$

Table 36: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.92408825885483 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.004	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0123		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1334		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1028		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1333		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.9 Reaction r_0038

This is a reversible reaction of two reactants forming two products influenced by eight modifiers.

Name 2-aceto-2-hydroxybutanoate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0232} + \mathrm{s\_1531} \xrightleftharpoons{\mathrm{e\_1137},\ \mathrm{e\_0034},\ \mathrm{e\_0035},\ \mathrm{e\_1136},\ \mathrm{s\_0232},\ \mathrm{s\_1531},\ \mathrm{s\_0041},\ \mathrm{s\_0543}} \mathrm{s\_0041} + \mathrm{s\_0543} \tag{18}$$

Reactants

Table 37: Properties of each reactant.

Id	Name	SBO
s_0232	2-Oxobutanoate	
s_1531	Pyruvate	

Modifiers

Table 38: Properties of each modifier.

Id	Name	SBO
e_1137	ilvB	0000460
e_0034	ilvI	0000460
e_0035	ilvH	0000460
e_1136	ilvN	0000460
s_0232	2-Oxobutanoate	
s_1531	Pyruvate	
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_0543	CO2	

Products

Table 39: Properties of each product.

Id	Name	SBO
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_9 = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0232}] \cdot [\text{s\_1531}] - \frac{[\text{s\_0041}] \cdot [\text{s\_0543}]}{\text{Keq}} \right)}{\text{Km0232} \cdot \text{Km1531}}}{\left(1 + \frac{[\text{s\_0232}]}{\text{Km0232}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) + \left(1 + \frac{[\text{s\_0041}]}{\text{Km0041}}\right) \cdot \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) - 1} \tag{19}$$

Table 40: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	☑
Vmax		0000324	0.563	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0232		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0041		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.10 Reaction r_0053

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0237} \xrightleftharpoons{\text{e\_0866, s\_0237, s\_0193, s\_0539}} \text{s\_0193} + \text{s\_0539} \tag{20}$$

Reactant

Table 41: Properties of each reactant.

Id	Name	SBO
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	

Modifiers

Table 42: Properties of each modifier.

Id	Name	SBO
e_0866	ispF	0000460
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0539	CMP	

Products

Table 43: Properties of each product.

Id	Name	SBO
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0539	CMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{10} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0237}] - \frac{[\text{s\_0193}] \cdot [\text{s\_0539}]}{\text{Keq}} \right)}{\text{Km0237}}}{1 + \frac{[\text{s\_0237}]}{\text{Km0237}} + \left(1 + \frac{[\text{s\_0193}]}{\text{Km0193}}\right) \cdot \left(1 + \frac{[\text{s\_0539}]}{\text{Km0539}}\right) - 1} \tag{21}$$

Table 44: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0237		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0193		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0539		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.11 Reaction r_0054

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 2-C-methyl-D-erythritol 4-phosphate cytidylyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0194} + \text{s\_0575} \xrightleftharpoons{\text{e\_0867, s\_0194, s\_0575, s\_0312, s\_0783}} \text{s\_0312} + \text{s\_0783} \qquad (22)$$

Reactants

Table 45: Properties of each reactant.

Id	Name	SBO
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_0575	CTP	

Modifiers

Table 46: Properties of each modifier.

Id	Name	SBO
e_0867	ispD	0000460
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_0575	CTP	
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0783	Diphosphate	

Products

Table 47: Properties of each product.

Id	Name	SBO
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{11} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0194}] \cdot [\text{s\_0575}] - \frac{[\text{s\_0312}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0194} \cdot \text{Km0575}}}{\left(1 + \frac{[\text{s\_0194}]}{\text{Km0194}}\right) \cdot \left(1 + \frac{[\text{s\_0575}]}{\text{Km0575}}\right) + \left(1 + \frac{[\text{s\_0312}]}{\text{Km0312}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{23}$$

Table 48: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0194		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0575		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0312		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.12 Reaction r_0056

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 2-dehydro-3-deoxy-phosphogluconate aldolase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0201} \xrightleftharpoons{\text{e\_0578, s\_0201, s\_0913, s\_1531}} \text{s\_0913} + \text{s\_1531} \tag{24}$$

Reactant

Table 49: Properties of each reactant.

Id	Name	SBO
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Modifiers

Table 50: Properties of each modifier.

Id	Name	SBO
e_0578	eda	0000460
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	

Products

Table 51: Properties of each product.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{12} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0201}] - \frac{[\text{s\_0913}] \cdot [\text{s\_1531}]}{\text{Keq}} \right)}{\text{Km0201}}}{1 + \frac{[\text{s\_0201}]}{\text{Km0201}} + \left(1 + \frac{[\text{s\_0913}]}{\text{Km0913}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) - 1} \tag{25}$$

Table 52: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	☑
Vmax		0000324	8.799	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0201		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0913		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.13 Reaction r_0063

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 2-dehydropantoate 2-reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0203} + \text{s\_1336} \xrightleftharpoons{\text{e\_0152, e\_1170, s\_0203, s\_1336, s\_1335, s\_0032}} \text{s\_1335} + \text{s\_0032} \tag{26}$$

Reactants

Table 53: Properties of each reactant.

Id	Name	SBO
s_0203	2-Dehydropantoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 54: Properties of each modifier.

Id	Name	SBO
e_0152	panE	0000460
e_1170	ilvC	0000460
s_0203	2-Dehydropantoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0032	(R)-Pantoate	

Products

Table 55: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0032	(R)-Pantoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{13} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0203}] \cdot [\text{s\_1336}] - \frac{[\text{s\_1335}] \cdot [\text{s\_0032}]}{\text{Keq}} \right)}{\text{Km0203} \cdot \text{Km1336}}}{\left(1 + \frac{[\text{s\_0203}]}{\text{Km0203}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) + \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) \cdot \left(1 + \frac{[\text{s\_0032}]}{\text{Km0032}}\right) - 1} \tag{27}$$

Table 56: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388884133 \cdot 10^{-5}$	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.001	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0203		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0032		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.14 Reaction r_0066

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 2-isopropylmalate hydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0266} \xrightleftharpoons{\mathrm{e\_0031},\ \mathrm{e\_0030},\ \mathrm{s\_0266},\ \mathrm{s\_0217}} \mathrm{s\_0217} \tag{28}$$

Reactant

Table 57: Properties of each reactant.

Id	Name	SBO
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	

Modifiers

Table 58: Properties of each modifier.

Id	Name	SBO
e_0031	leuC	0000460
e_0030	leuD	0000460
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	
s_0217	2-Isopropylmaleate	

Product

Table 59: Properties of each product.

Id	Name	SBO
s_0217	2-Isopropylmaleate	

Kinetic Law

Derived unit contains undeclared units

$$v_{14} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0266}] - \frac{[\text{s\_0217}]}{\text{Keq}} \right)}{\text{Km0266}}}{1 + \frac{[\text{s\_0266}]}{\text{Km0266}} + 1 + \frac{[\text{s\_0217}]}{\text{Km0217}} - 1} \tag{29}$$

Table 60: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	☑
Vmax		0000324	0.374	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0266		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0217		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.15 Reaction r_0067

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 2-isopropylmalate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0282} + \text{s\_0395} \xrightleftharpoons{\text{e\_0033, s\_0282, s\_0395, s\_0266, s\_0555}} \text{s\_0266} + \text{s\_0555} \tag{30}$$

Reactants

Table 61: Properties of each reactant.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	
s_0395	Acetyl-CoA	

Modifiers

Table 62: Properties of each modifier.

Id	Name	SBO
e_0033	leuA	0000460
s_0282	3-Methyl-2-oxobutanoate	
s_0395	Acetyl-CoA	
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	
s_0555	Coenzyme A	

Products

Table 63: Properties of each product.

Id	Name	SBO
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{15} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0282}] \cdot [\mathrm{s\_0395}] - \frac{[\mathrm{s\_0266}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0282} \cdot \mathrm{Km0395}}}{\left(1 + \frac{[\mathrm{s\_0282}]}{\mathrm{Km0282}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) + \left(1 + \frac{[\mathrm{s\_0266}]}{\mathrm{Km0266}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{31}$$

Table 64: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	☑
Vmax		0000324	0.874	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0282		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0395		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0266		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0555		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.16 Reaction r_0078

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name 2-Oxo-4-methyl-3-carboxypentanoate decarboxylation

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0267} \xrightleftharpoons{\text{s\_0267, s\_0328, s\_0543}} \text{s\_0328} + \text{s\_0543} \tag{32}$$

Reactant

Table 65: Properties of each reactant.

Id	Name	SBO
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	

Modifiers

Table 66: Properties of each modifier.

Id	Name	SBO
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	
s_0328	4-Methyl-2-oxopentanoate	
s_0543	CO2	

Products

Table 67: Properties of each product.

Id	Name	SBO
s_0328	4-Methyl-2-oxopentanoate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{16} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0267}] - \frac{[\text{s\_0328}] \cdot [\text{s\_0543}]}{\text{Keq}} \right)}{\text{Km0267}}}{1 + \frac{[\text{s\_0267}]}{\text{Km0267}} + \left(1 + \frac{[\text{s\_0328}]}{\text{Km0328}}\right) \cdot \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) - 1} \tag{33}$$

Table 68: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	☑
Vmax		0000324	0.624	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0267		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0328		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.17 Reaction r_0084

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name 2C-methyl-D-erythritol 2,4 cyclodiphosphate dehydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0193} + 2\,\text{s\_0861} \xrightleftharpoons{\text{e\_0238, e\_0798, e\_0911, s\_0193, s\_0861, s\_0862, s\_0123}} 2\,\text{s\_0862} + \text{s\_0123} \tag{34}$$

Reactants

Table 69: Properties of each reactant.

Id	Name	SBO
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0861	Flavodoxin reduced	

Modifiers

Table 70: Properties of each modifier.

Id	Name	SBO
e_0238	fldA	0000460

Id	Name	SBO
e_0798	ispG	0000460
e_0911	fldB	0000460
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0861	Flavodoxin reduced	
s_0862	flavodoxin semi oxidized	
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	

Products

Table 71: Properties of each product.

Id	Name	SBO
s_0862	flavodoxin semi oxidized	
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{17} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0193}] \cdot [\mathrm{s\_0861}]^2 - \frac{[\mathrm{s\_0862}]^2 \cdot [\mathrm{s\_0123}]}{\mathrm{Keq}} \right)}{\mathrm{Km0193} \cdot \mathrm{Km0861}^2}}{\left(1 + \frac{[\mathrm{s\_0193}]}{\mathrm{Km0193}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0861}]}{\mathrm{Km0861}}\right)^2 + \left(1 + \frac{[\mathrm{s\_0862}]}{\mathrm{Km0862}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_0123}]}{\mathrm{Km0123}}\right) - 1} \tag{35}$$

Table 72: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.010	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0193		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0861		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0862		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0123		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.18 Reaction r_0085

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3',5'-bisphosphate nucleotidase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0411} \xrightleftharpoons{\text{e\_1326, s\_0411, s\_0454, s\_1430}} \text{s\_0454} + \text{s\_1430} \tag{36}$$

Reactant

Table 73: Properties of each reactant.

Id	Name	SBO
s_0411	Adenosine 3',5'-bisphosphate	

Modifiers

Table 74: Properties of each modifier.

Id	Name	SBO
e_1326	cysQ	0000460
s_0411	Adenosine 3',5'-bisphosphate	
s_0454	AMP	
s_1430	Phosphate	

Products

Table 75: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{18} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0411}] - \frac{[\text{s\_0454}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0411}}}{1 + \frac{[\text{s\_0411}]}{\text{Km0411}} + \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{37}$$

Table 76: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.343	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0411		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0454		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.19 Reaction r_0092

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3,4-Dihydroxy-2-butanone-4-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0704} \xrightleftharpoons{\mathrm{e\_0960,\ s\_0704,\ s\_0255,\ s\_0867}} \mathrm{s\_0255} + \mathrm{s\_0867} \tag{38}$$

Reactant

Table 77: Properties of each reactant.

Id	Name	SBO
s_0704	D-Ribulose 5-phosphate	

Modifiers

Table 78: Properties of each modifier.

Id	Name	SBO
e_0960	ribB	0000460
s_0704	D-Ribulose 5-phosphate	
s_0255	3,4-dihydroxy-2-butanone 4-phosphate	
s_0867	Formate	

Products

Table 79: Properties of each product.

Id	Name	SBO
s_0255	3,4-dihydroxy-2-butanone 4-phosphate	
s_0867	Formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{19} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0704}] - \frac{[\text{s\_0255}] \cdot [\text{s\_0867}]}{\text{Keq}} \right)}{\text{Km0704}}}{1 + \frac{[\text{s\_0704}]}{\text{Km0704}} + \left(1 + \frac{[\text{s\_0255}]}{\text{Km0255}}\right) \cdot \left(1 + \frac{[\text{s\_0867}]}{\text{Km0867}}\right) - 1} \tag{39}$$

Table 80: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.23556926891731 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0704		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0255		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0867		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.20 Reaction r_0096

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-cis-2-trans-enoyl-CoA isomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1674} \xrightleftharpoons{\text{e\_1203, s\_1674, s\_0979}} \text{s\_0979} \tag{40}$$

Reactant

Table 81: Properties of each reactant.

Id	Name	SBO
s_1674	trans-Hexadec-2-enoyl-CoA	

Id	Name	SBO

Modifiers

Table 82: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
s_1674	trans-Hexadec-2-enoyl-CoA	
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	

Product

Table 83: Properties of each product.

Id	Name	SBO
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{20} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1674}] - \frac{[\mathrm{s\_0979}]}{\mathrm{Keq}} \right)}{\mathrm{Km1674}}}{1 + \frac{[\mathrm{s\_1674}]}{\mathrm{Km1674}} + 1 + \frac{[\mathrm{s\_0979}]}{\mathrm{Km0979}} - 1} \tag{41}$$

Table 84: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑
Vmax		0000324	0.125	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1674		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0979		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.21 Reaction r_0098

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-dehydroquinate dehydratase, irreversible

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0269} \xrightleftharpoons{\text{e\_0541, s\_0269, s\_0270}} \text{s\_0270} \tag{42}$$

Reactant

Table 85: Properties of each reactant.

Id	Name	SBO
s_0269	3-Dehydroquinate	

Modifiers

Table 86: Properties of each modifier.

Id	Name	SBO
e_0541	aroD	0000460
s_0269	3-Dehydroquinate	
s_0270	3-Dehydroshikimate	

Product

Table 87: Properties of each product.

Id	Name	SBO
s_0270	3-Dehydroshikimate	

Kinetic Law

Derived unit contains undeclared units

$$v_{21} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0269}] - \frac{[\text{s\_0270}]}{\text{Keq}} \right)}{\text{Km0269}}}{1 + \frac{[\text{s\_0269}]}{\text{Km0269}} + 1 + \frac{[\text{s\_0270}]}{\text{Km0270}} - 1} \tag{43}$$

Table 88: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	☑
Vmax		0000324	0.317	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0269		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0270		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.22 Reaction r_0099

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3-dehydroquinate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0195} \xrightleftharpoons{\mathrm{e\_1027},\ \mathrm{s\_0195},\ \mathrm{s\_0269},\ \mathrm{s\_1430}} \mathrm{s\_0269} + \mathrm{s\_1430} \tag{44}$$

Reactant

Table 89: Properties of each reactant.

Id	Name	SBO
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	

Modifiers

Table 90: Properties of each modifier.

Id	Name	SBO
e_1027	aroB	0000460
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	
s_0269	3-Dehydroquinate	
s_1430	Phosphate	

Products

Table 91: Properties of each product.

Id	Name	SBO
s_0269	3-Dehydroquinate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{22} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0195}] - \frac{[\text{s\_0269}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0195}}}{1 + \frac{[\text{s\_0195}]}{\text{Km0195}} + \left(1 + \frac{[\text{s\_0269}]}{\text{Km0269}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{45}$$

Table 92: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	☑
Vmax		0000324	0.528	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0195		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0269		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.23 Reaction r_0100

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy -D-manno-octulosonic -acid 8-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0611} + \text{s\_1484} \xrightleftharpoons{\text{e\_0406, s\_0611, s\_1484, s\_0272, s\_1430}} \text{s\_0272} + \text{s\_1430} \tag{46}$$

Reactants

Table 93: Properties of each reactant.

Id	Name	SBO
s_0611	D-Arabinose 5-phosphate	

Id	Name	SBO
s_1484	Phosphoenolpyruvate	

Modifiers

Table 94: Properties of each modifier.

Id	Name	SBO
e_0406	kdsA	0000460
s_0611	D-Arabinose 5-phosphate	
s_1484	Phosphoenolpyruvate	
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	
s_1430	Phosphate	

Products

Table 95: Properties of each product.

Id	Name	SBO
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{23} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0611}] \cdot [\mathrm{s\_1484}] - \frac{[\mathrm{s\_0272}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0611} \cdot \mathrm{Km1484}}}{\left(1 + \frac{[\mathrm{s\_0611}]}{\mathrm{Km0611}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1484}]}{\mathrm{Km1484}}\right) + \left(1 + \frac{[\mathrm{s\_0272}]}{\mathrm{Km0272}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{47}$$

Table 96: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	☑
Vmax		0000324	0.075	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0611		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1484		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0272		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.24 Reaction r_0101

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name 3-deoxy-D-arabino-heptulosonate 7-phosphate synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0621} + \mathrm{s\_1484} \xrightleftharpoons{\mathrm{e\_0544,\ e\_0827,\ e\_0263,\ s\_0621,\ s\_1484,\ s\_0195,\ s\_1430}} \mathrm{s\_0195} + \mathrm{s\_1430} \tag{48}$$

Reactants

Table 97: Properties of each reactant.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_1484	Phosphoenolpyruvate	

Modifiers

Table 98: Properties of each modifier.

Id	Name	SBO
e_0544	aroH	0000460
e_0827	aroF	0000460
e_0263	aroG	0000460
s_0621	D-Erythrose 4-phosphate	
s_1484	Phosphoenolpyruvate	
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	
s_1430	Phosphate	

Products

Table 99: Properties of each product.

Id	Name	SBO
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{24} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0621}] \cdot [\text{s\_1484}] - \frac{[\text{s\_0195}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0621} \cdot \text{Km1484}}}{\left(1 + \frac{[\text{s\_0621}]}{\text{Km0621}}\right) \cdot \left(1 + \frac{[\text{s\_1484}]}{\text{Km1484}}\right) + \left(1 + \frac{[\text{s\_0195}]}{\text{Km0195}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{49}$$

Table 100: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	☑
Vmax		0000324	0.739	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0621		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1484		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0195		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.25 Reaction r_0102

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy-D-manno-octulosonic acid transferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0542} + \text{s\_0147} \xrightleftharpoons{\text{e\_1125, s\_0542, s\_0147, s\_0539, s\_1038}} \text{s\_0539} + \text{s\_1038} \tag{50}$$

Reactants

Table 101: Properties of each reactant.

Id	Name
s_0542	CMP-3-deoxy-D-manno-octulosonate
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

Modifiers

Table 102: Properties of each modifier.

Id	Name
e_1125	waaA
s_0542	CMP-3-deoxy-D-manno-octulosonate
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate
s_0539	CMP
s_1038	KDO-lipid IV(A)

Products

Table 103: Properties of each product.

Id	Name	SBO
s_0539	CMP	
s_1038	KDO-lipid IV(A)	

Kinetic Law

Derived unit contains undeclared units

$$v_{25} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0542}] \cdot [\mathrm{s\_0147}] - \frac{[\mathrm{s\_0539}] \cdot [\mathrm{s\_1038}]}{\mathrm{Keq}} \right)}{\mathrm{Km0542} \cdot \mathrm{Km0147}}}{\left(1 + \frac{[\mathrm{s\_0542}]}{\mathrm{Km0542}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0147}]}{\mathrm{Km0147}}\right) + \left(1 + \frac{[\mathrm{s\_0539}]}{\mathrm{Km0539}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1038}]}{\mathrm{Km1038}}\right) - 1} \tag{51}$$

Table 104: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	☑
Vmax		0000324	0.038	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0542		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0147		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0539		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1038		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.26 Reaction r_0103

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy-D-manno-octulosonic acid transferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0542} + \text{s\_1038} \xrightleftharpoons{\text{e\_1125, s\_0542, s\_1038, s\_0539, s\_1033}} \text{s\_0539} + \text{s\_1033} \tag{52}$$

Reactants

Table 105: Properties of each reactant.

Id	Name	SBO
s_0542	CMP-3-deoxy-D-manno-octulosonate	
s_1038	KDO-lipid IV(A)	

Modifiers

Table 106: Properties of each modifier.

Id	Name	SBO
e_1125	waaA	0000460
s_0542	CMP-3-deoxy-D-manno-octulosonate	
s_1038	KDO-lipid IV(A)	
s_0539	CMP	
s_1033	KDO(2)-lipid IV(A)	

Products

Table 107: Properties of each product.

Id	Name	SBO
s_0539	CMP	
s_1033	KDO(2)-lipid IV(A)	

Kinetic Law

Derived unit contains undeclared units

$$v_{26} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0542}] \cdot [\text{s\_1038}] - \frac{[\text{s\_0539}] \cdot [\text{s\_1033}]}{\text{Keq}} \right)}{\text{Km0542} \cdot \text{Km1038}}}{\left(1 + \frac{[\text{s\_0542}]}{\text{Km0542}}\right) \cdot \left(1 + \frac{[\text{s\_1038}]}{\text{Km1038}}\right) + \left(1 + \frac{[\text{s\_0539}]}{\text{Km0539}}\right) \cdot \left(1 + \frac{[\text{s\_1033}]}{\text{Km1033}}\right) - 1} \tag{53}$$

Table 108: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	☑
Vmax		0000324	0.038	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0542		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1038		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0539		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1033		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.27 Reaction r_0105

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy-manno-octulosonate cytidylyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0575} + \mathrm{s\_0271} \xrightleftharpoons{\mathrm{e\_0331,\ s\_0575,\ s\_0271,\ s\_0542,\ s\_0783}} \mathrm{s\_0542} + \mathrm{s\_0783} \qquad (54)$$

Reactants

Table 109: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	
s_0271	3-Deoxy-D-manno-2-octulosonate	

Modifiers

Table 110: Properties of each modifier.

Id	Name	SBO
e_0331	kdsB	0000460
s_0575	CTP	
s_0271	3-Deoxy-D-manno-2-octulosonate	
s_0542	CMP-3-deoxy-D-manno-octulosonate	
s_0783	Diphosphate	

Products

Table 111: Properties of each product.

Id	Name	SBO
s_0542	CMP-3-deoxy-D-manno-octulosonate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{27} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0575}] \cdot [\text{s\_0271}] - \frac{[\text{s\_0542}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0575} \cdot \text{Km0271}}}{\left(1 + \frac{[\text{s\_0575}]}{\text{Km0575}}\right) \cdot \left(1 + \frac{[\text{s\_0271}]}{\text{Km0271}}\right) + \left(1 + \frac{[\text{s\_0542}]}{\text{Km0542}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{55}$$

Table 112: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	☑
Vmax		0000324	0.075	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0575		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0271		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0542		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.28 Reaction r_0106

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3-deoxy-manno-octulosonate-8-phosphatase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0272} \xrightleftharpoons{\text{e\_0994, s\_0272, s\_0271, s\_1430}} \text{s\_0271} + \text{s\_1430} \tag{56}$$

Reactant

Table 113: Properties of each reactant.

Id	Name	SBO
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	

Modifiers

Table 114: Properties of each modifier.

Id	Name	SBO
e_0994	kdsC	0000460
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	
s_0271	3-Deoxy-D-manno-2-octulosonate	
s_1430	Phosphate	

Products

Table 115: Properties of each product.

Id	Name	SBO
s_0271	3-Deoxy-D-manno-2-octulosonate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{28} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0272}] - \frac{[\text{s\_0271}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0272}}}{1 + \frac{[\text{s\_0272}]}{\text{Km0272}} + \left(1 + \frac{[\text{s\_0271}]}{\text{Km0271}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{57}$$

Table 116: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	☑
Vmax		0000324	0.054	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0272		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0271		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.29 Reaction r_0120

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxybutanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0043} \xrightleftharpoons{\text{e\_1203, e\_0735, s\_0043, s\_0574}} \text{s\_0574} \tag{58}$$

Reactant

Table 117: Properties of each reactant.

Id	Name	SBO
s_0043	(S)-3-Hydroxybutanoyl-CoA	

Modifiers

Table 118: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0043	(S)-3-Hydroxybutanoyl-CoA	
s_0574	Crotonoyl-CoA	

Product

Table 119: Properties of each product.

Id	Name	SBO
s_0574	Crotonoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{29} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0043}] - \frac{[\text{s\_0574}]}{\text{Keq}} \right)}{\text{Km0043}}}{1 + \frac{[\text{s\_0043}]}{\text{Km0043}} + 1 + \frac{[\text{s\_0574}]}{\text{Km0574}} - 1} \tag{59}$$

Table 120: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.296	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0043		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0574		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.30 Reaction r_0121

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxydecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0044} \xrightleftharpoons{\mathrm{e\_1203,\ e\_0735,\ s\_0044,\ s\_1668}} \mathrm{s\_1668} \tag{60}$$

Reactant

Table 121: Properties of each reactant.

Id	Name	SBO
s_0044	(S)-3-Hydroxydecanoyl-CoA	

Modifiers

Table 122: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0044	(S)-3-Hydroxydecanoyl-CoA	
s_1668	trans-Dec-2-enoyl-CoA	

Product

Table 123: Properties of each product.

Id	Name	SBO
s_1668	trans-Dec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{30} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0044}] - \frac{[\text{s\_1668}]}{\text{Keq}} \right)}{\text{Km0044}}}{1 + \frac{[\text{s\_0044}]}{\text{Km0044}} + 1 + \frac{[\text{s\_1668}]}{\text{Km1668}} - 1} \tag{61}$$

Table 124: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.296	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0044		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1668		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.31 Reaction r_0122

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxydodecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0045} \xrightleftharpoons{\text{e\_1203, e\_0735, s\_0045, s\_1670}} \text{s\_1670} \tag{62}$$

Reactant

Table 125: Properties of each reactant.

Id	Name	SBO
s_0045	(S)-3-Hydroxydodecanoyl-CoA	

Modifiers

Table 126: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0045	(S)-3-Hydroxydodecanoyl-CoA	
s_1670	trans-Dodec-2-enoyl-CoA	

Product

Table 127: Properties of each product.

Id	Name	SBO
s_1670	trans-Dodec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{31} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0045}] - \frac{[\mathrm{s\_1670}]}{\mathrm{Keq}} \right)}{\mathrm{Km0045}}}{1 + \frac{[\mathrm{s\_0045}]}{\mathrm{Km0045}} + 1 + \frac{[\mathrm{s\_1670}]}{\mathrm{Km1670}} - 1} \tag{63}$$

Table 128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.296	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0045		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1670		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.32 Reaction r_0123

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxyhexadecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0046} \xrightleftharpoons{\text{e\_1203, e\_0735, s\_0046, s\_1674}} \text{s\_1674} \tag{64}$$

Reactant

Table 129: Properties of each reactant.

Id	Name	SBO
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	

Modifiers

Table 130: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	
s_1674	trans-Hexadec-2-enoyl-CoA	

Product

Table 131: Properties of each product.

Id	Name	SBO
s_1674	trans-Hexadec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{32} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0046}] - \frac{[\text{s\_1674}]}{\text{Keq}} \right)}{\text{Km0046}}}{1 + \frac{[\text{s\_0046}]}{\text{Km0046}} + 1 + \frac{[\text{s\_1674}]}{\text{Km1674}} - 1} \tag{65}$$

Table 132: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.231	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0046		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1674		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.33 Reaction r_0124

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxyhexanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0047} \xrightleftharpoons{\mathrm{e\_1203,\ e\_0735,\ s\_0047,\ s\_1672}} \mathrm{s\_1672} \tag{66}$$

Reactant

Table 133: Properties of each reactant.

Id	Name	SBO
s_0047	(S)-3-Hydroxyhexanoyl-CoA	

Modifiers

Table 134: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0047	(S)-3-Hydroxyhexanoyl-CoA	
s_1672	trans-Hex-2-enoyl-CoA	

Product

Table 135: Properties of each product.

Id	Name	SBO
s_1672	trans-Hex-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{33} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0047}] - \frac{[\mathrm{s\_1672}]}{\mathrm{Keq}} \right)}{\mathrm{Km0047}}}{1 + \frac{[\mathrm{s\_0047}]}{\mathrm{Km0047}} + 1 + \frac{[\mathrm{s\_1672}]}{\mathrm{Km1672}} - 1} \tag{67}$$

Table 136: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.296	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0047		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1672		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.34 Reaction r_0126

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxyoctanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0049} \xrightleftharpoons{\mathrm{e\_1203,\ e\_0735,\ s\_0049,\ s\_1676}} \mathrm{s\_1676} \tag{68}$$

Reactant

Table 137: Properties of each reactant.

Id	Name	SBO
s_0049	(S)-3-Hydroxyoctanoyl-CoA	

Modifiers

Table 138: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460

Id	Name	SBO
e_0735	fadJ	0000460
s_0049	(S)-3-Hydroxyoctanoyl-CoA	
s_1676	trans-Oct-2-enoyl-CoA	

Product

Table 139: Properties of each product.

Id	Name	SBO
s_1676	trans-Oct-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{34} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0049}] - \frac{[\mathrm{s\_1676}]}{\mathrm{Keq}} \right)}{\mathrm{Km0049}}}{1 + \frac{[\mathrm{s\_0049}]}{\mathrm{Km0049}} + 1 + \frac{[\mathrm{s\_1676}]}{\mathrm{Km1676}} - 1} \tag{69}$$

Table 140: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.296	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0049		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1676		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.35 Reaction r_0127

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxytetradecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0050} \xrightleftharpoons{\mathrm{e\_1203,\ e\_0735,\ s\_0050,\ s\_1680}} \mathrm{s\_1680} \tag{70}$$

Reactant

Table 141: Properties of each reactant.

Id	Name	SBO
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	

Modifiers

Table 142: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	
s_1680	trans-Tetradec-2-enoyl-CoA	

Product

Table 143: Properties of each product.

Id	Name	SBO
s_1680	trans-Tetradec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{35} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0050}] - \frac{[\mathrm{s\_1680}]}{\mathrm{Keq}} \right)}{\mathrm{Km0050}}}{1 + \frac{[\mathrm{s\_0050}]}{\mathrm{Km0050}} + 1 + \frac{[\mathrm{s\_1680}]}{\mathrm{Km1680}} - 1} \tag{71}$$

Table 144: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	☑
Vmax		0000324	0.231	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0050		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1680		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.36 Reaction r_0128

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxodecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0293} + \mathrm{s\_1334} \xrightleftharpoons{\mathrm{e\_1203},\ \mathrm{e\_0735},\ \mathrm{s\_0293},\ \mathrm{s\_1334},\ \mathrm{s\_0044},\ \mathrm{s\_1333}} \mathrm{s\_0044} + \mathrm{s\_1333} \qquad (72)$$

Reactants

Table 145: Properties of each reactant.

Id	Name	SBO
s_0293	3-Oxodecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 146: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0293	3-Oxodecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0044	(S)-3-Hydroxydecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 147: Properties of each product.

Id	Name	SBO
s_0044	(S)-3-Hydroxydecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{36} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0293}] \cdot [\mathrm{s\_1334}] - \frac{[\mathrm{s\_0044}] \cdot [\mathrm{s\_1333}]}{\mathrm{Keq}} \right)}{\mathrm{Km0293} \cdot \mathrm{Km1334}}}{\left(1 + \frac{[\mathrm{s\_0293}]}{\mathrm{Km0293}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) + \left(1 + \frac{[\mathrm{s\_0044}]}{\mathrm{Km0044}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) - 1} \tag{73}$$

Table 148: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0293		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0044		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.37 Reaction r_0129

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxododecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0295} + \mathrm{s\_1334} \xrightleftharpoons{\mathrm{e\_1203,\ e\_0735,\ s\_0295,\ s\_1334,\ s\_0045,\ s\_1333}} \mathrm{s\_0045} + \mathrm{s\_1333} \tag{74}$$

Reactants

Table 149: Properties of each reactant.

Id	Name	SBO
s_0295	3-Oxododecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 150: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0295	3-Oxododecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0045	(S)-3-Hydroxydodecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 151: Properties of each product.

Id	Name	SBO
s_0045	(S)-3-Hydroxydodecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{37} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0295}] \cdot [\text{s\_1334}] - \frac{[\text{s\_0045}] \cdot [\text{s\_1333}]}{\text{Keq}} \right)}{\text{Km0295} \cdot \text{Km1334}}}{\left(1 + \frac{[\text{s\_0295}]}{\text{Km0295}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) + \left(1 + \frac{[\text{s\_0045}]}{\text{Km0045}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) - 1} \tag{75}$$

Table 152: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0295		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0045		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.38 Reaction r_0130

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxohexadecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0297} + \text{s\_1334} \xrightleftharpoons{\text{e\_1203, e\_0735, s\_0297, s\_1334, s\_0046, s\_1333}} \text{s\_0046} + \text{s\_1333} \qquad (76)$$

Reactants

Table 153: Properties of each reactant.

Id	Name	SBO
s_0297	3-Oxohexadecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 154: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0297	3-Oxohexadecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 155: Properties of each product.

Id	Name	SBO
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{38} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0297}] \cdot [\text{s\_1334}] - \frac{[\text{s\_0046}] \cdot [\text{s\_1333}]}{\text{Keq}} \right)}{\text{Km0297} \cdot \text{Km1334}}}{\left(1 + \frac{[\text{s\_0297}]}{\text{Km0297}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) + \left(1 + \frac{[\text{s\_0046}]}{\text{Km0046}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) - 1} \tag{77}$$

Table 156: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	☑
Vmax		0000324	0.539	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0297		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0046		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.39 Reaction r_0131

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxohexanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0299} + \text{s\_1334} \xrightleftharpoons{\text{e\_1203, e\_0735, s\_0299, s\_1334, s\_0047, s\_1333}} \text{s\_0047} + \text{s\_1333} \tag{78}$$

Reactants

Table 157: Properties of each reactant.

Id	Name	SBO
s_0299	3-Oxohexanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 158: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460

Id	Name	SBO
e_0735	fadJ	0000460
s_0299	3-Oxohexanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0047	(S)-3-Hydroxyhexanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 159: Properties of each product.

Id	Name	SBO
s_0047	(S)-3-Hydroxyhexanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{39} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0299}] \cdot [\mathrm{s\_1334}] - \frac{[\mathrm{s\_0047}] \cdot [\mathrm{s\_1333}]}{\mathrm{Keq}} \right)}{\mathrm{Km0299} \cdot \mathrm{Km1334}}}{\left(1 + \frac{[\mathrm{s\_0299}]}{\mathrm{Km0299}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) + \left(1 + \frac{[\mathrm{s\_0047}]}{\mathrm{Km0047}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) - 1} \tag{79}$$

Table 160: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0299		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0047		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.40 Reaction r_0133

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxooctanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0303} + \text{s\_1334} \xrightleftharpoons{\text{e\_1203, e\_0735, s\_0303, s\_1334, s\_0049, s\_1333}} \text{s\_0049} + \text{s\_1333} \tag{80}$$

Reactants

Table 161: Properties of each reactant.

Id	Name	SBO
s_0303	3-Oxooctanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 162: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0303	3-Oxooctanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0049	(S)-3-Hydroxyoctanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 163: Properties of each product.

Id	Name	SBO
s_0049	(S)-3-Hydroxyoctanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{40} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0303}] \cdot [\text{s\_1334}] - \frac{[\text{s\_0049}] \cdot [\text{s\_1333}]}{\text{Keq}} \right)}{\text{Km0303} \cdot \text{Km1334}}}{\left(1 + \frac{[\text{s\_0303}]}{\text{Km0303}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) + \left(1 + \frac{[\text{s\_0049}]}{\text{Km0049}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) - 1} \tag{81}$$

Table 164: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0303		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0049		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.41 Reaction r_0134

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxotetradecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0305} + \mathrm{s\_1334} \xrightleftharpoons{\mathrm{e\_1203,\ e\_0735,\ s\_0305,\ s\_1334,\ s\_0050,\ s\_1333}} \mathrm{s\_0050} + \mathrm{s\_1333} \qquad (82)$$

Reactants

Table 165: Properties of each reactant.

Id	Name	SBO
s_0305	3-Oxotetradecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 166: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0305	3-Oxotetradecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 167: Properties of each product.

Id	Name	SBO
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{41} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0305}] \cdot [\mathrm{s\_1334}] - \frac{[\mathrm{s\_0050}] \cdot [\mathrm{s\_1333}]}{\mathrm{Keq}} \right)}{\mathrm{Km0305} \cdot \mathrm{Km1334}}}{\left(1 + \frac{[\mathrm{s\_0305}]}{\mathrm{Km0305}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) + \left(1 + \frac{[\mathrm{s\_0050}]}{\mathrm{Km0050}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) - 1} \tag{83}$$

Table 168: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	☑
Vmax		0000324	0.539	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0305		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0050		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.42 Reaction r_0135

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (acetoacetyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0391} + \mathrm{s\_1334} \xrightleftharpoons{\mathrm{e\_1203,\ e\_0735,\ s\_0391,\ s\_1334,\ s\_0043,\ s\_1333}} \mathrm{s\_0043} + \mathrm{s\_1333} \tag{84}$$

Reactants

Table 169: Properties of each reactant.

Id	Name	SBO
s_0391	Acetoacetyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 170: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0391	Acetoacetyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0043	(S)-3-Hydroxybutanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 171: Properties of each product.

Id	Name	SBO
s_0043	(S)-3-Hydroxybutanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{42} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0391}] \cdot [\text{s\_1334}] - \frac{[\text{s\_0043}] \cdot [\text{s\_1333}]}{\text{Keq}} \right)}{\text{Km0391} \cdot \text{Km1334}}}{\left(1 + \frac{[\text{s\_0391}]}{\text{Km0391}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) + \left(1 + \frac{[\text{s\_0043}]}{\text{Km0043}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) - 1} \tag{85}$$

Table 172: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0391		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1334		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0043		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1333		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.43 Reaction r_0138

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-isopropylmalate dehydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0217} \xrightleftharpoons{\mathrm{e\_0031},\ \mathrm{e\_0030},\ \mathrm{s\_0217},\ \mathrm{s\_0265}} \mathrm{s\_0265} \tag{86}$$

Reactant

Table 173: Properties of each reactant.

Id	Name	SBO
s_0217	2-Isopropylmaleate	

Modifiers

Table 174: Properties of each modifier.

Id	Name	SBO
e_0031	leuC	0000460
e_0030	leuD	0000460
s_0217	2-Isopropylmaleate	
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	

Product

Table 175: Properties of each product.

Id	Name	SBO
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{43} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0217}] - \frac{[\text{s\_0265}]}{\text{Keq}} \right)}{\text{Km0217}}}{1 + \frac{[\text{s\_0217}]}{\text{Km0217}} + 1 + \frac{[\text{s\_0265}]}{\text{Km0265}} - 1} \tag{87}$$

Table 176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	☑
Vmax		0000324	0.374	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0217		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0265		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.44 Reaction r_0139

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-isopropylmalate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0265} + \text{s\_1333} \xrightleftharpoons{\text{e\_0032, s\_0265, s\_1333, s\_0267, s\_1334}} \text{s\_0267} + \text{s\_1334} \tag{88}$$

Reactants

Table 177: Properties of each reactant.

Id	Name	SBO
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 178: Properties of each modifier.

Id	Name	SBO
e_0032	leuB	0000460
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	
s_1333	Nicotinamide adenine dinucleotide	
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 179: Properties of each product.

Id	Name	SBO
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{44} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0265}] \cdot [\mathrm{s\_1333}] - \frac{[\mathrm{s\_0267}] \cdot [\mathrm{s\_1334}]}{\mathrm{Keq}} \right)}{\mathrm{Km0265} \cdot \mathrm{Km1333}}}{\left(1 + \frac{[\mathrm{s\_0265}]}{\mathrm{Km0265}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) + \left(1 + \frac{[\mathrm{s\_0267}]}{\mathrm{Km0267}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) - 1} \tag{89}$$

Table 180: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	☑
Vmax		0000324	0.874	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0265		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0267		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.45 Reaction r_0143

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-methyl-2-oxobutanoate hydroxymethyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0282} + \text{s\_0336} \xrightleftharpoons{\text{e\_0063, s\_0282, s\_0336, s\_0203, s\_0337}} \text{s\_0203} + \text{s\_0337} \tag{90}$$

Reactants

Table 181: Properties of each reactant.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	
s_0336	5,10-Methylenetetrahydrofolate	

Modifiers

Table 182: Properties of each modifier.

Id	Name	SBO
e_0063	panB	0000460
s_0282	3-Methyl-2-oxobutanoate	
s_0336	5,10-Methylenetetrahydrofolate	
s_0203	2-Dehydropantoate	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 183: Properties of each product.

Id	Name	SBO
s_0203	2-Dehydropantoate	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{45} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0282}] \cdot [\text{s\_0336}] - \frac{[\text{s\_0203}] \cdot [\text{s\_0337}]}{\text{Keq}} \right)}{\text{Km0282} \cdot \text{Km0336}}}{\left(1 + \frac{[\text{s\_0282}]}{\text{Km0282}}\right) \cdot \left(1 + \frac{[\text{s\_0336}]}{\text{Km0336}}\right) + \left(1 + \frac{[\text{s\_0203}]}{\text{Km0203}}\right) \cdot \left(1 + \frac{[\text{s\_0337}]}{\text{Km0337}}\right) - 1} \tag{91}$$

Table 184: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388884133 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0282		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0203		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0337		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.46 Reaction r_0145

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-Oxo-glutaryl-[ACP] methyl ester dehydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0276} \xrightleftharpoons{\text{e\_0082, s\_0276, s\_0812}} \text{s\_0812} \tag{92}$$

Reactant

Table 185: Properties of each reactant.

Id	Name	SBO
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	

Modifiers

Table 186: Properties of each modifier.

Id	Name	SBO
e_0082	fabZ	0000460
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	

Product

Table 187: Properties of each product.

Id	Name	SBO
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{46} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0276}] - \frac{[\text{s\_0812}]}{\text{Keq}} \right)}{\text{Km0276}}}{1 + \frac{[\text{s\_0276}]}{\text{Km0276}} + 1 + \frac{[\text{s\_0812}]}{\text{Km0812}} - 1} \tag{93}$$

Table 188: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$1.66220080730855 \cdot 10^{-6}$	$\text{mmol} \cdot 1^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0276		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0812		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑

6.47 Reaction r_0146

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-Oxo-glutaryl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1336} + \text{s\_0289} \xrightleftharpoons{\text{e\_0374, s\_1336, s\_0289, s\_0276, s\_1335}} \text{s\_0276} + \text{s\_1335} \tag{94}$$

Reactants

Table 189: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	

Modifiers

Table 190: Properties of each modifier.

Id	Name	SBO
e_0374	fabG	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 191: Properties of each product.

Id	Name	SBO
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{47} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1336}] \cdot [\mathrm{s\_0289}] - \frac{[\mathrm{s\_0276}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km1336} \cdot \mathrm{Km0289}}}{\left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0289}]}{\mathrm{Km0289}}\right) + \left(1 + \frac{[\mathrm{s\_0276}]}{\mathrm{Km0276}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{95}$$

Table 192: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$3.87846855038663 \cdot 10^{-6}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0289		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0276		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.48 Reaction r_0147

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 3-Oxo-glutaryl-[ACP] methyl ester synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1216} + \text{s\_1218} \xrightleftharpoons{\text{e\_0372, s\_1216, s\_1218, s\_0543, s\_0555, s\_0289}} \text{s\_0543} + \text{s\_0555} + \text{s\_0289} \tag{96}$$

Reactants

Table 193: Properties of each reactant.

Id	Name	SBO
s_1216	Malonyl-[acyl-carrier protein]	
s_1218	malonyl-CoA methyl ester	

Modifiers

Table 194: Properties of each modifier.

Id	Name	SBO
e_0372	fabH	0000460
s_1216	Malonyl-[acyl-carrier protein]	
s_1218	malonyl-CoA methyl ester	
s_0543	CO2	
s_0555	Coenzyme A	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	

Products

Table 195: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_0555	Coenzyme A	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{48} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1216}] \cdot [\text{s\_1218}] - \frac{[\text{s\_0543}] \cdot [\text{s\_0555}] \cdot [\text{s\_0289}]}{\text{Keq}} \right)}{\text{Km1216} \cdot \text{Km1218}}}{\left(1 + \frac{[\text{s\_1216}]}{\text{Km1216}}\right) \cdot \left(1 + \frac{[\text{s\_1218}]}{\text{Km1218}}\right) + \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) \cdot \left(1 + \frac{[\text{s\_0289}]}{\text{Km0289}}\right) - 1} \tag{97}$$

Table 196: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$6.0947362934647 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1216		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1218		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0289		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.49 Reaction r_0148

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-Oxo-pimeloyl-[ACP] methyl ester dehydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0277} \xrightleftharpoons{\text{e\_0082, s\_0277, s\_0813}} \text{s\_0813} \tag{98}$$

Reactant

Table 197: Properties of each reactant.

Id	Name	SBO
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	

Modifiers

Table 198: Properties of each modifier.

Id	Name	SBO
e_0082	fabZ	0000460
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	

Product

Table 199: Properties of each product.

Id	Name	SBO
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{49} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0277}] - \frac{[\mathrm{s\_0813}]}{\mathrm{Keq}} \right)}{\mathrm{Km0277}}}{1 + \frac{[\mathrm{s\_0277}]}{\mathrm{Km0277}} + 1 + \frac{[\mathrm{s\_0813}]}{\mathrm{Km0813}} - 1} \tag{99}$$

Table 200: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$1.66220080730855 \cdot 10^{-6}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0277		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0813		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.50 Reaction r_0149

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-Oxo-pimeloyl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1336} + \mathrm{s\_0290} \xrightleftharpoons{\mathrm{e\_0374,\ s\_1336,\ s\_0290,\ s\_0277,\ s\_1335}} \mathrm{s\_0277} + \mathrm{s\_1335} \tag{100}$$

Reactants

Table 201: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	

Modifiers

Table 202: Properties of each modifier.

Id	Name	SBO
e_0374	fabG	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 203: Properties of each product.

Id	Name	SBO
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{50} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1336}] \cdot [\mathrm{s\_0290}] - \frac{[\mathrm{s\_0277}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km1336} \cdot \mathrm{Km0290}}}{\left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0290}]}{\mathrm{Km0290}}\right) + \left(1 + \frac{[\mathrm{s\_0277}]}{\mathrm{Km0277}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{101}$$

Table 204: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$3.87846855038663 \cdot 10^{-6}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0290		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0277		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.51 Reaction r_0150

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 3-Oxo-pimeloyl-[ACP] methyl ester synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0910} + \mathrm{s\_1216} \xrightleftharpoons{\mathrm{e\_0732,\ s\_0910,\ s\_1216,\ s\_0397,\ s\_0543,\ s\_0290}} \mathrm{s\_0397} + \mathrm{s\_0543} + \mathrm{s\_0290} \tag{102}$$

Reactants

Table 205: Properties of each reactant.

Id	Name	SBO
s_0910	Glutaryl-[acyl-carrier protein] methyl ester	
s_1216	Malonyl-[acyl-carrier protein]	

Modifiers

Table 206: Properties of each modifier.

Id	Name	SBO
e_0732	fabB	0000460
s_0910	Glutaryl-[acyl-carrier protein] methyl ester	
s_1216	Malonyl-[acyl-carrier protein]	
s_0397	acyl carrier protein	
s_0543	CO2	
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	

Products

Table 207: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0543	CO2	
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{51} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0910}] \cdot [\text{s\_1216}] - \frac{[\text{s\_0397}] \cdot [\text{s\_0543}] \cdot [\text{s\_0290}]}{\text{Keq}} \right)}{\text{Km0910} \cdot \text{Km1216}}}{\left(1 + \frac{[\text{s\_0910}]}{\text{Km0910}}\right) \cdot \left(1 + \frac{[\text{s\_1216}]}{\text{Km1216}}\right) + \left(1 + \frac{[\text{s\_0397}]}{\text{Km0397}}\right) \cdot \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_0290}]}{\text{Km0290}}\right) - 1} \tag{103}$$

Table 208: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$6.0947362934647 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0910		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1216		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0397		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0290		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.52 Reaction r_0154

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-oxoacyl-[acyl-carrier-protein] reductase (n-C14:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0304} + \text{s\_1336} \xrightleftharpoons{\text{e\_0374, s\_0304, s\_1336, s\_0028, s\_1335}} \text{s\_0028} + \text{s\_1335} \tag{104}$$

Reactants

Table 209: Properties of each reactant.

Id	Name	SBO
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 210: Properties of each modifier.

Id	Name	SBO
e_0374	fabG	0000460
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 211: Properties of each product.

Id	Name	SBO
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{52} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0304}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_0028}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km0304} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0304}]}{\mathrm{Km0304}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_0028}]}{\mathrm{Km0028}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{105}$$

Table 212: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	☑
Vmax		0000324	0.151	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0304		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0028		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.53 Reaction r_0166

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name 3-oxoacyl-[acyl-carrier-protein] synthase (n-C14:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0789} + \mathrm{s\_1216} \xrightleftharpoons{\mathrm{e\_0376},\ \mathrm{e\_0732},\ \mathrm{s\_0789},\ \mathrm{s\_1216},\ \mathrm{s\_0304},\ \mathrm{s\_0397},\ \mathrm{s\_0543}} \mathrm{s\_0304} + \mathrm{s\_0397} + \mathrm{s\_0543} \quad (106)$$

Reactants

Table 213: Properties of each reactant.

Id	Name	SBO
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_1216	Malonyl-[acyl-carrier protein]	

Modifiers

Table 214: Properties of each modifier.

Id	Name	SBO
e_0376	fabF	0000460
e_0732	fabB	0000460
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_1216	Malonyl-[acyl-carrier protein]	
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_0397	acyl carrier protein	
s_0543	CO2	

Products

Table 215: Properties of each product.

Id	Name	SBO
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_0397	acyl carrier protein	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{53} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0789}] \cdot [\mathrm{s\_1216}] - \frac{[\mathrm{s\_0304}] \cdot [\mathrm{s\_0397}] \cdot [\mathrm{s\_0543}]}{\mathrm{Keq}} \right)}{\mathrm{Km0789} \cdot \mathrm{Km1216}}}{\left(1 + \frac{[\mathrm{s\_0789}]}{\mathrm{Km0789}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1216}]}{\mathrm{Km1216}}\right) + \left(1 + \frac{[\mathrm{s\_0304}]}{\mathrm{Km0304}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) - 1} \tag{107}$$

Table 216: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	☑
Vmax		0000324	0.237	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0789		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1216		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0304		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0397		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0543		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.54 Reaction r_0175

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-phosphoshikimate 1-carboxyvinyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1484} + \mathrm{s\_1574} \xrightleftharpoons{\mathrm{e\_0327,\ s\_1484,\ s\_1574,\ s\_0359,\ s\_1430}} \mathrm{s\_0359} + \mathrm{s\_1430} \tag{108}$$

Reactants

Table 217: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_1574	Shikimate 5-phosphate	

Modifiers

Table 218: Properties of each modifier.

Id	Name	SBO
e_0327	aroA	0000460
s_1484	Phosphoenolpyruvate	
s_1574	Shikimate 5-phosphate	
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	
s_1430	Phosphate	

Products

Table 219: Properties of each product.

Id	Name	SBO
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{54} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1484}] \cdot [\mathrm{s\_1574}] - \frac{[\mathrm{s\_0359}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km1484} \cdot \mathrm{Km1574}}}{\left(1 + \frac{[\mathrm{s\_1484}]}{\mathrm{Km1484}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1574}]}{\mathrm{Km1574}}\right) + \left(1 + \frac{[\mathrm{s\_0359}]}{\mathrm{Km0359}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{109}$$

Table 220: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	☑
Vmax		0000324	0.739	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1484		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1574		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0359		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.55 Reaction r_0176

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name 4,5-dihydroxy-2,3-pentanedione cyclization (spontaneous)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0310} \xrightleftharpoons{\mathrm{s\_0310,\ s\_0004}} \mathrm{s\_0004} \tag{110}$$

Reactant

Table 221: Properties of each reactant.

Id	Name	SBO
s_0310	4,5-dihydroxy-2,3-pentanedione	

Modifiers

Table 222: Properties of each modifier.

Id	Name	SBO
s_0310	4,5-dihydroxy-2,3-pentanedione	
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	

Product

Table 223: Properties of each product.

Id	Name	SBO
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	

Kinetic Law

Derived unit contains undeclared units

$$v_{55} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0310}] - \frac{[\text{s\_0004}]}{\text{Keq}} \right)}{\text{Km0310}}}{1 + \frac{[\text{s\_0310}]}{\text{Km0310}} + 1 + \frac{[\text{s\_0004}]}{\text{Km0004}} - 1} \tag{111}$$

Table 224: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.72332981485438 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0310		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0004		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.56 Reaction r_0178

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0312} + \text{s\_0467} \xrightleftharpoons{\text{e\_0404, s\_0312, s\_0467, s\_0237, s\_0421}} \text{s\_0237} + \text{s\_0421} \tag{112}$$

Reactants

Table 225: Properties of each reactant.

Id	Name	SBO
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0467	ATP	

Modifiers

Table 226: Properties of each modifier.

Id	Name	SBO
e_0404	ispE	0000460
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0467	ATP	
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0421	ADP	

Products

Table 227: Properties of each product.

Id	Name	SBO
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{56} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0312}] \cdot [\text{s\_0467}] - \frac{[\text{s\_0237}] \cdot [\text{s\_0421}]}{\text{Keq}} \right)}{\text{Km0312} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_0312}]}{\text{Km0312}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_0237}]}{\text{Km0237}}\right) \cdot \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) - 1} \quad (113)$$

Table 228: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0312		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0237		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.57 Reaction r_0179

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 4-amino-2-methyl-5-phosphomethylpyrimidine synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0342} + \mathrm{s\_1333} \xrightleftharpoons{\mathrm{e\_1254},\ \mathrm{s\_0342},\ \mathrm{s\_1333},\ \mathrm{s\_0313},\ \mathrm{s\_0867},\ \mathrm{s\_1334}} \mathrm{s\_0313} + 2\,\mathrm{s\_0867} + \mathrm{s\_1334} \tag{114}$$

Reactants

Table 229: Properties of each reactant.

Id	Name	SBO
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 230: Properties of each modifier.

Id	Name	SBO
e_1254	thiC	0000460
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1333	Nicotinamide adenine dinucleotide	
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0867	Formate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 231: Properties of each product.

Id	Name	SBO
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0867	Formate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{57} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0342}] \cdot [\text{s\_1333}] - \frac{[\text{s\_0313}] \cdot [\text{s\_0867}]^2 \cdot [\text{s\_1334}]}{\text{Keq}} \right)}{\text{Km0342} \cdot \text{Km1333}}}{\left(1 + \frac{[\text{s\_0342}]}{\text{Km0342}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) + \left(1 + \frac{[\text{s\_0313}]}{\text{Km0313}}\right) \cdot \left(1 + \frac{[\text{s\_0867}]}{\text{Km0867}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) - 1} \tag{115}$$

Table 232: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	☑
Km0342		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0313		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0867		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.58 Reaction r_0181

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 4-amino-4-deoxychorismate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0526} + \text{s\_1101} \xrightleftharpoons{\text{e\_1015, e\_0572, s\_0526, s\_1101, s\_0316, s\_1095}} \text{s\_0316} + \text{s\_1095} \tag{116}$$

Reactants

Table 233: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	
s_1101	L-Glutamine	

Modifiers

Table 234: Properties of each modifier.

Id	Name	SBO
e_1015	pabA	0000460
e_0572	pabB	0000460
s_0526	chorismate	
s_1101	L-Glutamine	
s_0316	4-amino-4-deoxychorismate	
s_1095	L-Glutamate	

Products

Table 235: Properties of each product.

Id	Name	SBO
s_0316	4-amino-4-deoxychorismate	
s_1095	L-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{58} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0526}] \cdot [\mathrm{s\_1101}] - \frac{[\mathrm{s\_0316}] \cdot [\mathrm{s\_1095}]}{\mathrm{Keq}} \right)}{\mathrm{Km0526} \cdot \mathrm{Km1101}}}{\left(1 + \frac{[\mathrm{s\_0526}]}{\mathrm{Km0526}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1101}]}{\mathrm{Km1101}}\right) + \left(1 + \frac{[\mathrm{s\_0316}]}{\mathrm{Km0316}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) - 1} \tag{117}$$

Table 236: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0526		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1101		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0316		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1095		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.59 Reaction r_0182

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 4-aminobenzoate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0316} \xrightleftharpoons{\text{e\_0377, s\_0316, s\_0318, s\_1531}} \text{s\_0318} + \text{s\_1531} \tag{118}$$

Reactant

Table 237: Properties of each reactant.

Id	Name	SBO
s_0316	4-amino-4-deoxychorismate	

Modifiers

Table 238: Properties of each modifier.

Id	Name	SBO
e_0377	pabC	0000460
s_0316	4-amino-4-deoxychorismate	
s_0318	4-Aminobenzoate	
s_1531	Pyruvate	

Products

Table 239: Properties of each product.

Id	Name	SBO
s_0318	4-Aminobenzoate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{59} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0316}] - \frac{[\text{s\_0318}] \cdot [\text{s\_1531}]}{\text{Keq}} \right)}{\text{Km0316}}}{1 + \frac{[\text{s\_0316}]}{\text{Km0316}} + \left(1 + \frac{[\text{s\_0318}]}{\text{Km0318}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) - 1} \tag{119}$$

Table 240: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0316		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0318		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1531		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.60 Reaction r_0186

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 5'-deoxyadenosine nuclosidase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0333} \xrightleftharpoons{\mathrm{e\_0074,\ s\_0333,\ s\_0334,\ s\_0405}} \mathrm{s\_0334} + \mathrm{s\_0405} \tag{120}$$

Reactant

Table 241: Properties of each reactant.

Id	Name	SBO
s_0333	5'-Deoxyadenosine	

Modifiers

Table 242: Properties of each modifier.

Id	Name	SBO
e_0074	mtnN	0000460
s_0333	5'-Deoxyadenosine	
s_0334	5'-deoxyribose	
s_0405	Adenine	

Products

Table 243: Properties of each product.

Id	Name	SBO
s_0334	5'-deoxyribose	
s_0405	Adenine	

Kinetic Law

Derived unit contains undeclared units

$$v_{60} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0333}] - \frac{[\text{s\_0334}] \cdot [\text{s\_0405}]}{\text{Keq}} \right)}{\text{Km0333}}}{1 + \frac{[\text{s\_0333}]}{\text{Km0333}} + \left(1 + \frac{[\text{s\_0334}]}{\text{Km0334}}\right) \cdot \left(1 + \frac{[\text{s\_0405}]}{\text{Km0405}}\right) - 1} \tag{121}$$

Table 244: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.11662651885034 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.11662651885034 \cdot 10^{-4}$	$\text{mmol} \cdot 1^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot 1^{-1}$	☑
Km0333		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0334		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0405		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑

6.61 Reaction r_0211

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 5,10-methylenetetrahydrofolate reductase (NADH)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0336} + \text{s\_1334} \xrightleftharpoons{\text{e\_1234, s\_0336, s\_1334, s\_0354, s\_1333}} \text{s\_0354} + \text{s\_1333} \tag{122}$$

Reactants

Table 245: Properties of each reactant.

Id	Name	SBO
s_0336	5,10-Methylenetetrahydrofolate	

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 246: Properties of each modifier.

Id	Name	SBO
e_1234	metF	0000460
s_0336	5,10-Methylenetetrahydrofolate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0354	5-Methyltetrahydrofolate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 247: Properties of each product.

Id	Name	SBO
s_0354	5-Methyltetrahydrofolate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{61} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0336}] \cdot [\mathrm{s\_1334}] - \frac{[\mathrm{s\_0354}] \cdot [\mathrm{s\_1333}]}{\mathrm{Keq}} \right)}{\mathrm{Km0336} \cdot \mathrm{Km1334}}}{\left(1 + \frac{[\mathrm{s\_0336}]}{\mathrm{Km0336}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) + \left(1 + \frac{[\mathrm{s\_0354}]}{\mathrm{Km0354}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) - 1} \tag{123}$$

Table 248: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑
Vmax		0000324	0.299	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0354		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.62 Reaction r_0212

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 5-amino-6-(5-phosphoribosylamino)uracil reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0347} + \text{s\_1336} \xrightleftharpoons{\text{e\_0144, s\_0347, s\_1336, s\_0346, s\_1335}} \text{s\_0346} + \text{s\_1335} \tag{124}$$

Reactants

Table 249: Properties of each reactant.

Id	Name	SBO
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 250: Properties of each modifier.

Id	Name	SBO
e_0144	ribD	0000460
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 251: Properties of each product.

Id	Name	SBO
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{62} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0347}] \cdot [\text{s\_1336}] - \frac{[\text{s\_0346}] \cdot [\text{s\_1335}]}{\text{Keq}} \right)}{\text{Km0347} \cdot \text{Km1336}}}{\left(1 + \frac{[\text{s\_0347}]}{\text{Km0347}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) + \left(1 + \frac{[\text{s\_0346}]}{\text{Km0346}}\right) \cdot \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) - 1} \tag{125}$$

Table 252: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$8.64898488242119 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0347		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0346		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.63 Reaction r_0216

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 6-hydroxymethyl-dihydropterin pyrophosphokinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0367} + \text{s\_0467} \xrightleftharpoons{\text{e\_0064, s\_0367, s\_0467, s\_0368, s\_0454}} \text{s\_0368} + \text{s\_0454} \tag{126}$$

Reactants

Table 253: Properties of each reactant.

Id	Name	SBO
s_0367	6-hydroxymethyl dihydropterin	
s_0467	ATP	

Modifiers

Table 254: Properties of each modifier.

Id	Name	SBO
e_0064	folK	0000460

Id	Name	SBO
s_0367	6-hydroxymethyl dihydropterin	
s_0467	ATP	
s_0368	6-hydroxymethyl-dihydropterin pyrophosphate	
s_0454	AMP	

Products

Table 255: Properties of each product.

Id	Name	SBO
s_0368	6-hydroxymethyl-dihydropterin pyrophosphate	
s_0454	AMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{63} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0367}] \cdot [\text{s\_0467}] - \frac{[\text{s\_0368}] \cdot [\text{s\_0454}]}{\text{Keq}} \right)}{\text{Km0367} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_0367}]}{\text{Km0367}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_0368}]}{\text{Km0368}}\right) \cdot \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) - 1} \tag{127}$$

Table 256: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0367		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0368		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.64 Reaction r_0217

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 6-phosphogluconate dehydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0369} \xrightleftharpoons{\text{e\_0579, s\_0369, s\_0201}} \text{s\_0201} \tag{128}$$

Reactant

Table 257: Properties of each reactant.

Id	Name	SBO
s_0369	6-Phospho-D-gluconate	

Modifiers

Table 258: Properties of each modifier.

Id	Name	SBO
e_0579	edd	0000460
s_0369	6-Phospho-D-gluconate	
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Product

Table 259: Properties of each product.

Id	Name	SBO
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{64} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0369}] - \frac{[\text{s\_0201}]}{\text{Keq}} \right)}{\text{Km0369}}}{1 + \frac{[\text{s\_0369}]}{\text{Km0369}} + 1 + \frac{[\text{s\_0201}]}{\text{Km0201}} - 1} \tag{129}$$

Table 260: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	☑
Vmax		0000324	5.279	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0369		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0201		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.65 Reaction r_0218

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 6-phosphogluconolactonase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0370} \xrightleftharpoons{\mathrm{e\_0273,\ s\_0370,\ s\_0369}} \mathrm{s\_0369} \tag{130}$$

Reactant

Table 261: Properties of each reactant.

Id	Name	SBO
s_0370	6-phospho-D-glucono-1,5-lactone	

Modifiers

Table 262: Properties of each modifier.

Id	Name	SBO
e_0273	pgl	0000460
s_0370	6-phospho-D-glucono-1,5-lactone	
s_0369	6-Phospho-D-gluconate	

Product

Table 263: Properties of each product.

Id	Name	SBO
s_0369	6-Phospho-D-gluconate	

Kinetic Law

Derived unit contains undeclared units

$$v_{65} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0370}] - \frac{[\text{s\_0369}]}{\text{Keq}} \right)}{\text{Km0370}}}{1 + \frac{[\text{s\_0370}]}{\text{Km0370}} + 1 + \frac{[\text{s\_0369}]}{\text{Km0369}} - 1} \tag{131}$$

Table 264: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	☑
Vmax		0000324	5.279	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0370		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0369		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.66 Reaction r_0222

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 8-amino-7-oxononanoate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1041} + \text{s\_1491} \xrightleftharpoons{\text{e\_0276, s\_1041, s\_1491, s\_0376, s\_0397, s\_0543}} \text{s\_0376} + \text{s\_0397} + \text{s\_0543} \tag{132}$$

Reactants

Table 265: Properties of each reactant.

Id	Name	SBO
s_1041	L-Alanine	
s_1491	Pimeloyl-[acyl-carrier protein]	

Modifiers

Table 266: Properties of each modifier.

Id	Name	SBO
e_0276	bioF	0000460
s_1041	L-Alanine	
s_1491	Pimeloyl-[acyl-carrier protein]	
s_0376	8-Amino-7-oxononanoate	
s_0397	acyl carrier protein	
s_0543	CO2	

Products

Table 267: Properties of each product.

Id	Name	SBO
s_0376	8-Amino-7-oxononanoate	
s_0397	acyl carrier protein	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{66} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1041}] \cdot [\mathrm{s\_1491}] - \frac{[\mathrm{s\_0376}] \cdot [\mathrm{s\_0397}] \cdot [\mathrm{s\_0543}]}{\mathrm{Keq}} \right)}{\mathrm{Km1041} \cdot \mathrm{Km1491}}}{\left(1 + \frac{[\mathrm{s\_1041}]}{\mathrm{Km1041}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1491}]}{\mathrm{Km1491}}\right) + \left(1 + \frac{[\mathrm{s\_0376}]}{\mathrm{Km0376}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) - 1} \tag{133}$$

Table 268: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$6.0947362934647 \cdot 10^{-6}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1041		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1491		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0376		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0397		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.67 Reaction r_0224

This is a reversible reaction of three reactants forming two products influenced by seven modifiers.

Name acetaldehyde dehydrogenase (acetylating)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0381} + \text{s\_0555} + \text{s\_1333} \xrightleftharpoons{\text{e\_0125, e\_0416, s\_0381, s\_0555, s\_1333, s\_0395, s\_1334}} \text{s\_0395} + \text{s\_1334} \quad (134)$$

Reactants

Table 269: Properties of each reactant.

Id	Name	SBO
s_0381	Acetaldehyde	
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 270: Properties of each modifier.

Id	Name	SBO
e_0125	mhpF	0000460
e_0416	adhE	0000460
s_0381	Acetaldehyde	
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	
s_0395	Acetyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 271: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{67} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0381}] \cdot [\text{s\_0555}] \cdot [\text{s\_1333}] - \frac{[\text{s\_0395}] \cdot [\text{s\_1334}]}{\text{Keq}} \right)}{\text{Km0381} \cdot \text{Km0555} \cdot \text{Km1333}}}{\left(1 + \frac{[\text{s\_0381}]}{\text{Km0381}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) + \left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) - 1} \tag{135}$$

Table 272: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.911	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km0381		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0395		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.68 Reaction r_0225

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name acetate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0384} + \text{s\_0467} \xrightleftharpoons{\text{e\_0975, e\_0719, e\_0577, s\_0384, s\_0467, s\_0393, s\_0421}} \text{s\_0393} + \text{s\_0421} \tag{136}$$

Reactants

Table 273: Properties of each reactant.

Id	Name	SBO
s_0384	Acetate	
s_0467	ATP	

Modifiers

Table 274: Properties of each modifier.

Id	Name	SBO
e_0975	tdcD	0000460
e_0719	ackA	0000460
e_0577	purT	0000460
s_0384	Acetate	
s_0467	ATP	
s_0393	Acetyl phosphate	
s_0421	ADP	

Products

Table 275: Properties of each product.

Id	Name	SBO
s_0393	Acetyl phosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{68} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0384}] \cdot [\mathrm{s\_0467}] - \frac{[\mathrm{s\_0393}] \cdot [\mathrm{s\_0421}]}{\mathrm{Keq}} \right)}{\mathrm{Km0384} \cdot \mathrm{Km0467}}}{\left(1 + \frac{[\mathrm{s\_0384}]}{\mathrm{Km0384}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) + \left(1 + \frac{[\mathrm{s\_0393}]}{\mathrm{Km0393}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) - 1} \tag{137}$$

Table 276: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.081	dimensionless	☑
Vmax		0000324	1.130	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0384		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0393		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.69 Reaction r_0227

This is a reversible reaction of one reactant forming two products influenced by seven modifiers.

Name acetolactate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\mathrm{s\_1531} \xrightleftharpoons{\mathrm{e\_1137,\ e\_0034,\ e\_0035,\ e\_1136,\ s\_1531,\ s\_0042,\ s\_0543}} \mathrm{s\_0042} + \mathrm{s\_0543} \qquad (138)$$

Reactant

Table 277: Properties of each reactant.

Id	Name	SBO
s_1531	Pyruvate	

Modifiers

Table 278: Properties of each modifier.

Id	Name	SBO
e_1137	ilvB	0000460
e_0034	ilvI	0000460
e_0035	ilvH	0000460
e_1136	ilvN	0000460
s_1531	Pyruvate	
s_0042	(S)-2-Acetolactate	
s_0543	CO2	

Products

Table 279: Properties of each product.

Id	Name	SBO
s_0042	(S)-2-Acetolactate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{69} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1531}]^2 - \frac{[\text{s\_0042}] \cdot [\text{s\_0543}]}{\text{Keq}} \right)}{\text{Km1531}^2}}{\left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right)^2 + \left(1 + \frac{[\text{s\_0042}]}{\text{Km0042}}\right) \cdot \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) - 1} \tag{139}$$

Table 280: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	☑
Vmax		0000324	1.695	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0042		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.70 Reaction r_0230

This is a reversible reaction of one reactant forming two products influenced by six modifiers.

Name acetyl-CoA C-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\text{s\_0395} \xrightleftharpoons{\text{e\_0682, e\_1202, e\_0736, s\_0395, s\_0391, s\_0555}} \text{s\_0391} + \text{s\_0555} \tag{140}$$

Reactant

Table 281: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	

Modifiers

Table 282: Properties of each modifier.

Id	Name	SBO
e_0682	atoB	0000460
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0391	Acetoacetyl-CoA	
s_0555	Coenzyme A	

Products

Table 283: Properties of each product.

Id	Name	SBO
s_0391	Acetoacetyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{70} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0395}]^2 - \frac{[\mathrm{s\_0391}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0395}^2}}{\left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right)^2 + \left(1 + \frac{[\mathrm{s\_0391}]}{\mathrm{Km0391}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{141}$$

Table 284: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0391		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0555		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.71 Reaction r_0231

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (butanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0395} + \mathrm{s\_0488} \xrightleftharpoons{\mathrm{e\_1202},\ \mathrm{e\_0736},\ \mathrm{s\_0395},\ \mathrm{s\_0488},\ \mathrm{s\_0299},\ \mathrm{s\_0555}} \mathrm{s\_0299} + \mathrm{s\_0555} \qquad (142)$$

Reactants

Table 285: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0488	Butanoyl-CoA	

Modifiers

Table 286: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0488	Butanoyl-CoA	
s_0299	3-Oxohexanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 287: Properties of each product.

Id	Name	SBO
s_0299	3-Oxohexanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{71} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0395}] \cdot [\text{s\_0488}] - \frac{[\text{s\_0299}] \cdot [\text{s\_0555}]}{\text{Keq}} \right)}{\text{Km0395} \cdot \text{Km0488}}}{\left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_0488}]}{\text{Km0488}}\right) + \left(1 + \frac{[\text{s\_0299}]}{\text{Km0299}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) - 1} \tag{143}$$

Table 288: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0488		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0299		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.72 Reaction r_0232

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (decanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0395} + \text{s\_0737} \xrightleftharpoons{\text{e\_1202, e\_0736, s\_0395, s\_0737, s\_0295, s\_0555}} \text{s\_0295} + \text{s\_0555} \tag{144}$$

Reactants

Table 289: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0737	Decanoyl-CoA (n-C10:0CoA)	

Modifiers

Table 290: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0737	Decanoyl-CoA (n-C10:0CoA)	
s_0295	3-Oxododecanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 291: Properties of each product.

Id	Name	SBO
s_0295	3-Oxododecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{72} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0395}] \cdot [\mathrm{s\_0737}] - \frac{[\mathrm{s\_0295}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0395} \cdot \mathrm{Km0737}}}{\left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0737}]}{\mathrm{Km0737}}\right) + \left(1 + \frac{[\mathrm{s\_0295}]}{\mathrm{Km0295}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{145}$$

Table 292: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0395		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0737		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0295		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0555		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.73 Reaction r_0233

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (dodecanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0395} + \mathrm{s\_0790} \xrightleftharpoons{\mathrm{e\_1202},\ \mathrm{e\_0736},\ \mathrm{s\_0395},\ \mathrm{s\_0790},\ \mathrm{s\_0305},\ \mathrm{s\_0555}} \mathrm{s\_0305} + \mathrm{s\_0555} \qquad (146)$$

Reactants

Table 293: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	

Modifiers

Table 294: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	
s_0305	3-Oxotetradecanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 295: Properties of each product.

Id	Name	SBO
s_0305	3-Oxotetradecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{73} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0395}] \cdot [\text{s\_0790}] - \frac{[\text{s\_0305}] \cdot [\text{s\_0555}]}{\text{Keq}} \right)}{\text{Km0395} \cdot \text{Km0790}}}{\left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_0790}]}{\text{Km0790}}\right) + \left(1 + \frac{[\text{s\_0305}]}{\text{Km0305}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) - 1} \tag{147}$$

Table 296: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	☑
Vmax		0000324	0.539	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0790		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0305		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.74 Reaction r_0234

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (hexanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0395} + \text{s\_0984} \xrightleftharpoons{\text{e\_1202, e\_0736, s\_0395, s\_0984, s\_0303, s\_0555}} \text{s\_0303} + \text{s\_0555} \tag{148}$$

Reactants

Table 297: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	

Modifiers

Table 298: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	
s_0303	3-Oxooctanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 299: Properties of each product.

Id	Name	SBO
s_0303	3-Oxooctanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{74} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0395}] \cdot [\mathrm{s\_0984}] - \frac{[\mathrm{s\_0303}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0395} \cdot \mathrm{Km0984}}}{\left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0984}]}{\mathrm{Km0984}}\right) + \left(1 + \frac{[\mathrm{s\_0303}]}{\mathrm{Km0303}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{149}$$

Table 300: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0395		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0984		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0303		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0555		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.75 Reaction r_0235

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (octanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0395} + \mathrm{s\_1390} \xrightleftharpoons{\mathrm{e\_1202},\ \mathrm{e\_0736},\ \mathrm{s\_0395},\ \mathrm{s\_1390},\ \mathrm{s\_0293},\ \mathrm{s\_0555}} \mathrm{s\_0293} + \mathrm{s\_0555} \qquad (150)$$

Reactants

Table 301: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1390	Octanoyl-CoA (n-C8:0CoA)	

Modifiers

Table 302: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_1390	Octanoyl-CoA (n-C8:0CoA)	
s_0293	3-Oxodecanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 303: Properties of each product.

Id	Name	SBO
s_0293	3-Oxodecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{75} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0395}] \cdot [\text{s\_1390}] - \frac{[\text{s\_0293}] \cdot [\text{s\_0555}]}{\text{Keq}} \right)}{\text{Km0395} \cdot \text{Km1390}}}{\left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_1390}]}{\text{Km1390}}\right) + \left(1 + \frac{[\text{s\_0293}]}{\text{Km0293}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) - 1} \tag{151}$$

Table 304: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1390		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0293		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.76 Reaction r_0236

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (tetradecanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0395} + \text{s\_1632} \xrightleftharpoons{\text{e\_1202, e\_0736, s\_0395, s\_1632, s\_0297, s\_0555}} \text{s\_0297} + \text{s\_0555} \tag{152}$$

Reactants

Table 305: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	

Modifiers

Table 306: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	
s_0297	3-Oxohexadecanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 307: Properties of each product.

Id	Name	SBO
s_0297	3-Oxohexadecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{76} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0395}] \cdot [\mathrm{s\_1632}] - \frac{[\mathrm{s\_0297}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0395} \cdot \mathrm{Km1632}}}{\left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1632}]}{\mathrm{Km1632}}\right) + \left(1 + \frac{[\mathrm{s\_0297}]}{\mathrm{Km0297}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{153}$$

Table 308: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	☑
Vmax		0000324	0.539	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0395		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1632		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0297		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0555		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.77 Reaction r_0237

This is a reversible reaction of three reactants forming three products influenced by ten modifiers.

Name acetyl-CoA carboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0395} + \mathrm{s\_0467} + \mathrm{s\_0474} \xrightleftharpoons{\mathrm{e\_0085},\ \mathrm{e\_1006},\ \mathrm{e\_1005},\ \mathrm{e\_0730},\ \mathrm{s\_0395},\ \mathrm{s\_0467},\ \mathrm{s\_0474},\ \mathrm{s\_0421},\ \mathrm{s\_1217},\ \mathrm{s\_1430}} \mathrm{s\_0421} \tag{154}$$

Reactants

Table 309: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0467	ATP	
s_0474	Bicarbonate	

Modifiers

Table 310: Properties of each modifier.

Id	Name	SBO
e_0085	accA	0000460
e_1006	accC	0000460
e_1005	accB	0000460
e_0730	accD	0000460
s_0395	Acetyl-CoA	
s_0467	ATP	
s_0474	Bicarbonate	
s_0421	ADP	
s_1217	Malonyl-CoA	

Id	Name	SBO
s_1430	Phosphate	

Products

Table 311: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1217	Malonyl-CoA	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{77} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0395}] \cdot [\text{s\_0467}] \cdot [\text{s\_0474}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1217}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0395} \cdot \text{Km0467} \cdot \text{Km0474}}}{\left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0474}]}{\text{Km0474}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1217}]}{\text{Km1217}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{155}$$

Table 312: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	☑
Vmax		0000324	0.323	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0474		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1217		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.78 Reaction r_0243

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acetylglutamate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1302} + \text{s\_0467} \xrightleftharpoons{\text{e\_1243, s\_1302, s\_0467, s\_1304, s\_0421}} \text{s\_1304} + \text{s\_0421} \tag{156}$$

Reactants

Table 313: Properties of each reactant.

Id	Name	SBO
s_1302	N-Acetyl-L-glutamate	
s_0467	ATP	

Modifiers

Table 314: Properties of each modifier.

Id	Name	SBO
e_1243	argB	0000460
s_1302	N-Acetyl-L-glutamate	
s_0467	ATP	
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_0421	ADP	

Products

Table 315: Properties of each product.

Id	Name	SBO
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{78} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1302}] \cdot [\text{s\_0467}] - \frac{[\text{s\_1304}] \cdot [\text{s\_0421}]}{\text{Keq}} \right)}{\text{Km1302} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_1302}]}{\text{Km1302}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_1304}]}{\text{Km1304}}\right) \cdot \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) - 1} \tag{157}$$

Table 316: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.574	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1302		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1304		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.79 Reaction r_0244

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name acetylornithine deacetylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1321} \xrightleftharpoons{\mathrm{e\_1241},\ \mathrm{s\_1321},\ \mathrm{s\_0384},\ \mathrm{s\_1391}} \mathrm{s\_0384} + \mathrm{s\_1391} \tag{158}$$

Reactant

Table 317: Properties of each reactant.

Id	Name	SBO
s_1321	N2-Acetyl-L-ornithine	

Modifiers

Table 318: Properties of each modifier.

Id	Name	SBO
e_1241	argE	0000460
s_1321	N2-Acetyl-L-ornithine	
s_0384	Acetate	
s_1391	Ornithine	

Products

Table 319: Properties of each product.

Id	Name	SBO
s_0384	Acetate	
s_1391	Ornithine	

Kinetic Law

Derived unit contains undeclared units

$$v_{79} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1321}] - \frac{[\text{s\_0384}] \cdot [\text{s\_1391}]}{\text{Keq}} \right)}{\text{Km1321}}}{1 + \frac{[\text{s\_1321}]}{\text{Km1321}} + \left(1 + \frac{[\text{s\_0384}]}{\text{Km0384}}\right) \cdot \left(1 + \frac{[\text{s\_1391}]}{\text{Km1391}}\right) - 1} \tag{159}$$

Table 320: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.410	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1321		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0384		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1391		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.80 Reaction r_0245

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetylornithine transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1303} + \text{s\_1095} \xrightleftharpoons{\text{e\_0559, e\_1014, s\_1303, s\_1095, s\_1321, s\_0233}} \text{s\_1321} + \text{s\_0233} \tag{160}$$

Reactants

Table 321: Properties of each reactant.

Id	Name	SBO
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	

Id	Name	SBO
s_1095	L-Glutamate	

Modifiers

Table 322: Properties of each modifier.

Id	Name	SBO
e_0559	astC	0000460
e_1014	argD	0000460
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	
s_1095	L-Glutamate	
s_1321	N2-Acetyl-L-ornithine	
s_0233	2-Oxoglutarate	

Products

Table 323: Properties of each product.

Id	Name	SBO
s_1321	N2-Acetyl-L-ornithine	
s_0233	2-Oxoglutarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{80} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1303}] \cdot [\mathrm{s\_1095}] - \frac{[\mathrm{s\_1321}] \cdot [\mathrm{s\_0233}]}{\mathrm{Keq}} \right)}{\mathrm{Km1303} \cdot \mathrm{Km1095}}}{\left(1 + \frac{[\mathrm{s\_1303}]}{\mathrm{Km1303}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) + \left(1 + \frac{[\mathrm{s\_1321}]}{\mathrm{Km1321}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) - 1} \tag{161}$$

Table 324: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.574	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1303		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1095		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1321		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0233		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.81 Reaction r_0246

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name aconitase (half-reaction A, Citrate hydro-lyase)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0536} \xrightleftharpoons{\text{e\_0431, e\_0054, s\_0536, s\_0530}} \text{s\_0530} \tag{162}$$

Reactant

Table 325: Properties of each reactant.

Id	Name	SBO
s_0536	Citrate	

Modifiers

Table 326: Properties of each modifier.

Id	Name	SBO
e_0431	acnA	0000460
e_0054	acnB	0000460
s_0536	Citrate	
s_0530	cis-Aconitate	

Product

Table 327: Properties of each product.

Id	Name	SBO
s_0530	cis-Aconitate	

Kinetic Law

Derived unit contains undeclared units

$$v_{81} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0536}] - \frac{[\text{s\_0530}]}{\text{Keq}} \right)}{\text{Km0536}}}{1 + \frac{[\text{s\_0536}]}{\text{Km0536}} + 1 + \frac{[\text{s\_0530}]}{\text{Km0530}} - 1} \tag{163}$$

Table 328: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	☑
Vmax		0000324	0.894	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0536		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0530		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.82 Reaction r_0247

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name aconitase (half-reaction B, Isocitrate hydro-lyase)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0530} \xrightleftharpoons{\mathrm{e\_0431,\ e\_0054,\ s\_0530,\ s\_1027}} \mathrm{s\_1027} \tag{164}$$

Reactant

Table 329: Properties of each reactant.

Id	Name	SBO
s_0530	cis-Aconitate	

Modifiers

Table 330: Properties of each modifier.

Id	Name	SBO
e_0431	acnA	0000460
e_0054	acnB	0000460
s_0530	cis-Aconitate	
s_1027	Isocitrate	

Product

Table 331: Properties of each product.

Id	Name	SBO
s_1027	Isocitrate	

Kinetic Law

Derived unit contains undeclared units

$$v_{82} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0530}] - \frac{[\text{s\_1027}]}{\text{Keq}} \right)}{\text{Km0530}}}{1 + \frac{[\text{s\_0530}]}{\text{Km0530}} + 1 + \frac{[\text{s\_1027}]}{\text{Km1027}} - 1} \tag{165}$$

Table 332: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	☑
Vmax		0000324	0.894	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0530		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1027		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.83 Reaction r_0257

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name acyl-[acyl-carrier-protein] synthetase (n-C12:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0397} + \text{s\_0467} + \text{s\_0785} \xrightleftharpoons{\text{e\_0375, e\_0896, s\_0397, s\_0467, s\_0785, s\_0454, s\_0789, s\_0783}} \text{s\_0454} + \text{s\_0789} + \text{s\_078} \tag{166}$$

Reactants

Table 333: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	

Id	Name	SBO
s_0467	ATP	
s_0785	Dodecanoate (n-C12:0)	

Modifiers

Table 334: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0896	aas	0000460
s_0397	acyl carrier protein	
s_0467	ATP	
s_0785	Dodecanoate (n-C12:0)	
s_0454	AMP	
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_0783	Diphosphate	

Products

Table 335: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{83} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0397}] \cdot [\mathrm{s\_0467}] \cdot [\mathrm{s\_0785}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_0789}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0397} \cdot \mathrm{Km0467} \cdot \mathrm{Km0785}}}{\left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0785}]}{\mathrm{Km0785}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0789}]}{\mathrm{Km0789}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{167}$$

Table 336: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.323	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0397		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0785		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0454		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0789		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.84 Reaction r_0259

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name acyl-[acyl-carrier-protein] synthetase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0397} + \mathrm{s\_0467} + \mathrm{s\_0971} \xrightleftharpoons{\mathrm{e\_0375,\ e\_0896,\ s\_0397,\ s\_0467,\ s\_0971,\ s\_0454,\ s\_1411,\ s\_0783}} \mathrm{s\_0454} + \mathrm{s\_1411} + \mathrm{s\_078} \tag{168}$$

Reactants

Table 337: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0467	ATP	
s_0971	Hexadecanoate (n-C16:0)	

Modifiers

Table 338: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0896	aas	0000460
s_0397	acyl carrier protein	
s_0467	ATP	

Id	Name	SBO
s_0971	Hexadecanoate (n-C16:0)	
s_0454	AMP	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0783	Diphosphate	

Products

Table 339: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{84} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0397}] \cdot [\mathrm{s\_0467}] \cdot [\mathrm{s\_0971}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_1411}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0397} \cdot \mathrm{Km0467} \cdot \mathrm{Km0971}}}{\left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0971}]}{\mathrm{Km0971}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1411}]}{\mathrm{Km1411}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{169}$$

Table 340: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.018	dimensionless	☑
Vmax		0000324	0.530	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0397		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0971		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0454		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1411		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.85 Reaction r_0260

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name acyl-[acyl-carrier-protein] synthetase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0397} + \mathrm{s\_0467} + \mathrm{s\_0976} \xrightleftharpoons{\mathrm{e\_0375,\ e\_0896,\ s\_0397,\ s\_0467,\ s\_0976,\ s\_0454,\ s\_0533,\ s\_0783}} \mathrm{s\_0454} + \mathrm{s\_0533} + \mathrm{s\_078}$$

(170)

Reactants

Table 341: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0467	ATP	
s_0976	Hexadecenoate (n-C16:1)	

Modifiers

Table 342: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0896	aas	0000460
s_0397	acyl carrier protein	
s_0467	ATP	
s_0976	Hexadecenoate (n-C16:1)	
s_0454	AMP	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0783	Diphosphate	

Products

Table 343: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{85} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0397}] \cdot [\mathrm{s\_0467}] \cdot [\mathrm{s\_0976}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_0533}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0397} \cdot \mathrm{Km0467} \cdot \mathrm{Km0976}}}{\left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0976}]}{\mathrm{Km0976}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0533}]}{\mathrm{Km0533}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{171}$$

Table 344: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑
Vmax		0000324	0.625	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0397		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0976		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0454		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0533		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.86 Reaction r_0266

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (butanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0574} + \mathrm{s\_0860} \xrightleftharpoons{\mathrm{e\_0094,\ s\_0574,\ s\_0860,\ s\_0488,\ s\_0859}} \mathrm{s\_0488} + \mathrm{s\_0859} \tag{172}$$

Reactants

Table 345: Properties of each reactant.

Id	Name	SBO
s_0574	Crotonoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	

Modifiers

Table 346: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0574	Crotonoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	
s_0488	Butanoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	

Products

Table 347: Properties of each product.

Id	Name	SBO
s_0488	Butanoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{86} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0574}] \cdot [\mathrm{s\_0860}] - \frac{[\mathrm{s\_0488}] \cdot [\mathrm{s\_0859}]}{\mathrm{Keq}} \right)}{\mathrm{Km0574} \cdot \mathrm{Km0860}}}{\left(1 + \frac{[\mathrm{s\_0574}]}{\mathrm{Km0574}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0860}]}{\mathrm{Km0860}}\right) + \left(1 + \frac{[\mathrm{s\_0488}]}{\mathrm{Km0488}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0859}]}{\mathrm{Km0859}}\right) - 1} \tag{173}$$

Table 348: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0574		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0860		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0488		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0859		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.87 Reaction r_0267

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (decanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1668} + \mathrm{s\_0860} \xrightleftharpoons{\mathrm{e\_0094},\ \mathrm{s\_1668},\ \mathrm{s\_0860},\ \mathrm{s\_0737},\ \mathrm{s\_0859}} \mathrm{s\_0737} + \mathrm{s\_0859} \tag{174}$$

Reactants

Table 349: Properties of each reactant.

Id	Name	SBO
s_1668	trans-Dec-2-enoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	

Modifiers

Table 350: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_1668	trans-Dec-2-enoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	
s_0737	Decanoyl-CoA (n-C10:0CoA)	
s_0859	Flavin adenine dinucleotide oxidized	

Products

Table 351: Properties of each product.

Id	Name	SBO
s_0737	Decanoyl-CoA (n-C10:0CoA)	
s_0859	Flavin adenine dinucleotide oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{87} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1668}] \cdot [\text{s\_0860}] - \frac{[\text{s\_0737}] \cdot [\text{s\_0859}]}{\text{Keq}} \right)}{\text{Km1668} \cdot \text{Km0860}}}{\left(1 + \frac{[\text{s\_1668}]}{\text{Km1668}}\right) \cdot \left(1 + \frac{[\text{s\_0860}]}{\text{Km0860}}\right) + \left(1 + \frac{[\text{s\_0737}]}{\text{Km0737}}\right) \cdot \left(1 + \frac{[\text{s\_0859}]}{\text{Km0859}}\right) - 1} \tag{175}$$

Table 352: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1668		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0737		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.88 Reaction r_0268

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (dodecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1670} + \text{s\_0860} \xrightleftharpoons{\text{e\_0094, s\_1670, s\_0860, s\_0790, s\_0859}} \text{s\_0790} + \text{s\_0859} \tag{176}$$

Reactants

Table 353: Properties of each reactant.

Id	Name	SBO
s_1670	trans-Dodec-2-enoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	

Modifiers

Table 354: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_1670	trans-Dodec-2-enoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	
s_0859	Flavin adenine dinucleotide oxidized	

Products

Table 355: Properties of each product.

Id	Name	SBO
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	
s_0859	Flavin adenine dinucleotide oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{88} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1670}] \cdot [\mathrm{s\_0860}] - \frac{[\mathrm{s\_0790}] \cdot [\mathrm{s\_0859}]}{\mathrm{Keq}} \right)}{\mathrm{Km1670} \cdot \mathrm{Km0860}}}{\left(1 + \frac{[\mathrm{s\_1670}]}{\mathrm{Km1670}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0860}]}{\mathrm{Km0860}}\right) + \left(1 + \frac{[\mathrm{s\_0790}]}{\mathrm{Km0790}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0859}]}{\mathrm{Km0859}}\right) - 1} \tag{177}$$

Table 356: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1670		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0860		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0790		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0859		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.89 Reaction r_0269

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (hexadecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0860} + \mathrm{s\_1674} \xrightleftharpoons{\mathrm{e\_0094},\ \mathrm{s\_0860},\ \mathrm{s\_1674},\ \mathrm{s\_0859},\ \mathrm{s\_1412}} \mathrm{s\_0859} + \mathrm{s\_1412} \tag{178}$$

Reactants

Table 357: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1674	trans-Hexadec-2-enoyl-CoA	

Modifiers

Table 358: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1674	trans-Hexadec-2-enoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	
s_1412	Palmitoyl-CoA (n-C16:0CoA)	

Products

Table 359: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1412	Palmitoyl-CoA (n-C16:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{89} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0860}] \cdot [\text{s\_1674}] - \frac{[\text{s\_0859}] \cdot [\text{s\_1412}]}{\text{Keq}} \right)}{\text{Km0860} \cdot \text{Km1674}}}{\left(1 + \frac{[\text{s\_0860}]}{\text{Km0860}}\right) \cdot \left(1 + \frac{[\text{s\_1674}]}{\text{Km1674}}\right) + \left(1 + \frac{[\text{s\_0859}]}{\text{Km0859}}\right) \cdot \left(1 + \frac{[\text{s\_1412}]}{\text{Km1412}}\right) - 1} \tag{179}$$

Table 360: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.018	dimensionless	☑
Vmax		0000324	0.248	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1674		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1412		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.90 Reaction r_0270

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (hexanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0860} + \text{s\_1672} \xrightleftharpoons{\text{e\_0094, s\_0860, s\_1672, s\_0859, s\_0984}} \text{s\_0859} + \text{s\_0984} \tag{180}$$

Reactants

Table 361: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1672	trans-Hex-2-enoyl-CoA	

Modifiers

Table 362: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1672	trans-Hex-2-enoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	

Products

Table 363: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{90} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0860}] \cdot [\mathrm{s\_1672}] - \frac{[\mathrm{s\_0859}] \cdot [\mathrm{s\_0984}]}{\mathrm{Keq}} \right)}{\mathrm{Km0860} \cdot \mathrm{Km1672}}}{\left(1 + \frac{[\mathrm{s\_0860}]}{\mathrm{Km0860}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1672}]}{\mathrm{Km1672}}\right) + \left(1 + \frac{[\mathrm{s\_0859}]}{\mathrm{Km0859}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0984}]}{\mathrm{Km0984}}\right) - 1} \tag{181}$$

Table 364: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0860		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1672		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0859		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0984		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.91 Reaction r_0272

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (octanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0860} + \mathrm{s\_1676} \xrightleftharpoons{\mathrm{e\_0094},\ \mathrm{s\_0860},\ \mathrm{s\_1676},\ \mathrm{s\_0859},\ \mathrm{s\_1390}} \mathrm{s\_0859} + \mathrm{s\_1390} \tag{182}$$

Reactants

Table 365: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1676	trans-Oct-2-enoyl-CoA	

Modifiers

Table 366: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1676	trans-Oct-2-enoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	
s_1390	Octanoyl-CoA (n-C8:0CoA)	

Products

Table 367: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1390	Octanoyl-CoA (n-C8:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{91} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0860}] \cdot [\text{s\_1676}] - \frac{[\text{s\_0859}] \cdot [\text{s\_1390}]}{\text{Keq}} \right)}{\text{Km0860} \cdot \text{Km1676}}}{\left(1 + \frac{[\text{s\_0860}]}{\text{Km0860}}\right) \cdot \left(1 + \frac{[\text{s\_1676}]}{\text{Km1676}}\right) + \left(1 + \frac{[\text{s\_0859}]}{\text{Km0859}}\right) \cdot \left(1 + \frac{[\text{s\_1390}]}{\text{Km1390}}\right) - 1} \tag{183}$$

Table 368: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	☑
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1676		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1390		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.92 Reaction r_0273

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (tetradecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0860} + \text{s\_1680} \xrightleftharpoons{\text{e\_0094, s\_0860, s\_1680, s\_0859, s\_1632}} \text{s\_0859} + \text{s\_1632} \tag{184}$$

Reactants

Table 369: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1680	trans-Tetradec-2-enoyl-CoA	

Modifiers

Table 370: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1680	trans-Tetradec-2-enoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	

Products

Table 371: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{92} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0860}] \cdot [\mathrm{s\_1680}] - \frac{[\mathrm{s\_0859}] \cdot [\mathrm{s\_1632}]}{\mathrm{Keq}} \right)}{\mathrm{Km0860} \cdot \mathrm{Km1680}}}{\left(1 + \frac{[\mathrm{s\_0860}]}{\mathrm{Km0860}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1680}]}{\mathrm{Km1680}}\right) + \left(1 + \frac{[\mathrm{s\_0859}]}{\mathrm{Km0859}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1632}]}{\mathrm{Km1632}}\right) - 1} \tag{185}$$

Table 372: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	☑
Vmax		0000324	0.539	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0860		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1680		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0859		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1632		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.93 Reaction r_0292

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name adenosine kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0408} + \mathrm{s\_0467} \xrightleftharpoons{\mathrm{e\_0167},\ \mathrm{s\_0408},\ \mathrm{s\_0467},\ \mathrm{s\_0421},\ \mathrm{s\_0454}} \mathrm{s\_0421} + \mathrm{s\_0454} \tag{186}$$

Reactants

Table 373: Properties of each reactant.

Id	Name	SBO
s_0408	Adenosine	
s_0467	ATP	

Modifiers

Table 374: Properties of each modifier.

Id	Name	SBO
e_0167	adk	0000460
s_0408	Adenosine	
s_0467	ATP	
s_0421	ADP	
s_0454	AMP	

Products

Table 375: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0454	AMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{93} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0408}] \cdot [\text{s\_0467}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0454}]}{\text{Keq}} \right)}{\text{Km0408} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_0408}]}{\text{Km0408}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) - 1} \quad (187)$$

Table 376: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.32217621027432 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0408		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.94 Reaction r_0297

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name adenosylmethionine-8-amino-7-oxononanoate transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0376} + \text{s\_1552} \xrightleftharpoons{\text{e\_0274, s\_0376, s\_1552, s\_1550, s\_0371}} \text{s\_1550} + \text{s\_0371} \quad (188)$$

Reactants

Table 377: Properties of each reactant.

Id	Name	SBO
s_0376	8-Amino-7-oxononanoate	
s_1552	S-Adenosyl-L-methionine	

Modifiers

Table 378: Properties of each modifier.

Id	Name	SBO
e_0274	bioA	0000460
s_0376	8-Amino-7-oxononanoate	
s_1552	S-Adenosyl-L-methionine	
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	
s_0371	7,8-Diaminononanoate	

Products

Table 379: Properties of each product.

Id	Name	SBO
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	
s_0371	7,8-Diaminononanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{94} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0376}] \cdot [\mathrm{s\_1552}] - \frac{[\mathrm{s\_1550}] \cdot [\mathrm{s\_0371}]}{\mathrm{Keq}} \right)}{\mathrm{Km0376} \cdot \mathrm{Km1552}}}{\left(1 + \frac{[\mathrm{s\_0376}]}{\mathrm{Km0376}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1552}]}{\mathrm{Km1552}}\right) + \left(1 + \frac{[\mathrm{s\_1550}]}{\mathrm{Km1550}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0371}]}{\mathrm{Km0371}}\right) - 1} \tag{189}$$

Table 380: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$3.87846855038663 \cdot 10^{-6}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0376		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1552		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1550		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0371		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.95 Reaction r_0301

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name adenylate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0454} + \mathrm{s\_0467} \xrightleftharpoons{\mathrm{e\_0167},\ \mathrm{s\_0454},\ \mathrm{s\_0467},\ \mathrm{s\_0421}} 2\,\mathrm{s\_0421} \tag{190}$$

Reactants

Table 381: Properties of each reactant.

Id	Name	SBO
s_0454	AMP	
s_0467	ATP	

Modifiers

Table 382: Properties of each modifier.

Id	Name	SBO
e_0167	adk	0000460
s_0454	AMP	
s_0467	ATP	
s_0421	ADP	

Product

Table 383: Properties of each product.

Id	Name	SBO
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{95} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0454}] \cdot [\text{s\_0467}] - \frac{[\text{s\_0421}]^2}{\text{Keq}} \right)}{\text{Km0454} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right)^2 - 1} \tag{191}$$

Table 384: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.362	dimensionless	☑
Vmax		0000324	5.072	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0454		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.96 Reaction r_0302

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name adenylosuccinate lyase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0040} \xrightleftharpoons{\text{e\_0389, s\_0040, s\_0343, s\_0875}} \text{s\_0343} + \text{s\_0875} \tag{192}$$

Reactant

Table 385: Properties of each reactant.

Id	Name	SBO
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	

Modifiers

Table 386: Properties of each modifier.

Id	Name	SBO
e_0389	purB	0000460
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0875	Fumarate	

Products

Table 387: Properties of each product.

Id	Name	SBO
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0875	Fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{96} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0040}] - \frac{[\text{s\_0343}] \cdot [\text{s\_0875}]}{\text{Keq}} \right)}{\text{Km0040}}}{1 + \frac{[\text{s\_0040}]}{\text{Km0040}} + \left(1 + \frac{[\text{s\_0343}]}{\text{Km0343}}\right) \cdot \left(1 + \frac{[\text{s\_0875}]}{\text{Km0875}}\right) - 1} \tag{193}$$

Table 388: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	0.614	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0040		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0343		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0875		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.97 Reaction r_0303

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name adenylosuccinate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1072} + \mathrm{s\_0945} + \mathrm{s\_1006} \xrightleftharpoons{\mathrm{e\_1315,\ s\_1072,\ s\_0945,\ s\_1006,\ s\_1327,\ s\_0896,\ s\_1430}} \mathrm{s\_1327} + \mathrm{s\_0896} + \mathrm{s\_1430} \quad (194)$$

Reactants

Table 389: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0945	GTP	
s_1006	IMP	

Modifiers

Table 390: Properties of each modifier.

Id	Name	SBO
e_1315	purA	0000460
s_1072	L-Aspartate	
s_0945	GTP	
s_1006	IMP	
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	
s_0896	GDP	
s_1430	Phosphate	

Products

Table 391: Properties of each product.

Id	Name	SBO
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	
s_0896	GDP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{97} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1072}] \cdot [\text{s\_0945}] \cdot [\text{s\_1006}] - \frac{[\text{s\_1327}] \cdot [\text{s\_0896}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km1072} \cdot \text{Km0945} \cdot \text{Km1006}}}{\left(1 + \frac{[\text{s\_1072}]}{\text{Km1072}}\right) \cdot \left(1 + \frac{[\text{s\_0945}]}{\text{Km0945}}\right) \cdot \left(1 + \frac{[\text{s\_1006}]}{\text{Km1006}}\right) + \left(1 + \frac{[\text{s\_1327}]}{\text{Km1327}}\right) \cdot \left(1 + \frac{[\text{s\_0896}]}{\text{Km0896}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{195}$$

Table 392: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	1.223	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0945		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1006		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1327		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0896		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.98 Reaction r_0304

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name adenylsuccinate lyase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1327} \xrightleftharpoons{\text{e\_0389, s\_1327, s\_0454, s\_0875}} \text{s\_0454} + \text{s\_0875} \tag{196}$$

Reactant

Table 393: Properties of each reactant.

Id	Name	SBO
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	

Modifiers

Table 394: Properties of each modifier.

Id	Name	SBO
e_0389	purB	0000460
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	
s_0454	AMP	
s_0875	Fumarate	

Products

Table 395: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0875	Fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{98} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1327}] - \frac{[\text{s\_0454}] \cdot [\text{s\_0875}]}{\text{Keq}} \right)}{\text{Km1327}}}{1 + \frac{[\text{s\_1327}]}{\text{Km1327}} + \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) \cdot \left(1 + \frac{[\text{s\_0875}]}{\text{Km0875}}\right) - 1} \tag{197}$$

Table 396: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.408	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1327		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0875		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.99 Reaction r_0305

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name adenylyl-sulfate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0412} + \text{s\_0467} \xrightleftharpoons{\text{e\_0868, s\_0412, s\_0467, s\_0421, s\_0252}} \text{s\_0421} + \text{s\_0252} \tag{198}$$

Reactants

Table 397: Properties of each reactant.

Id	Name	SBO
s_0412	Adenosine 5'-phosphosulfate	
s_0467	ATP	

Modifiers

Table 398: Properties of each modifier.

Id	Name	SBO
e_0868	cysC	0000460
s_0412	Adenosine 5'-phosphosulfate	
s_0467	ATP	
s_0421	ADP	
s_0252	3'-Phosphoadenylyl sulfate	

Products

Table 399: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0252	3'-Phosphoadenylyl sulfate	

Kinetic Law

Derived unit contains undeclared units

$$v_{99} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0412}] \cdot [\text{s\_0467}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0252}]}{\text{Keq}} \right)}{\text{Km0412} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_0412}]}{\text{Km0412}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0252}]}{\text{Km0252}}\right) - 1} \tag{199}$$

Table 400: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.481	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0412		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0252		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.100 Reaction r_0310

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name alanine racemase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1041} \xrightleftharpoons{\mathrm{e\_0395,\ e\_1275,\ s\_1041,\ s\_0600}} \mathrm{s\_0600} \tag{200}$$

Reactant

Table 401: Properties of each reactant.

Id	Name	SBO
s_1041	L-Alanine	

Modifiers

Table 402: Properties of each modifier.

Id	Name	SBO
e_0395	dadX	0000460
e_1275	alr	0000460
s_1041	L-Alanine	
s_0600	D-Alanine	

Product

Table 403: Properties of each product.

Id	Name	SBO
s_0600	D-Alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{100} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1041}] - \frac{[\text{s\_0600}]}{\text{Keq}} \right)}{\text{Km1041}}}{1 + \frac{[\text{s\_1041}]}{\text{Km1041}} + 1 + \frac{[\text{s\_0600}]}{\text{Km0600}} - 1} \tag{201}$$

Table 404: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.006	dimensionless	☑
Vmax		0000324	0.035	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1041		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0600		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.101 Reaction r_0348

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name anthranilate phosphoribosyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0457} + \text{s\_0360} \xrightleftharpoons{\text{e\_0428, s\_0457, s\_0360, s\_0783, s\_1278}} \text{s\_0783} + \text{s\_1278} \tag{202}$$

Reactants

Table 405: Properties of each reactant.

Id	Name	SBO
s_0457	Anthranilate	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 406: Properties of each modifier.

Id	Name	SBO
e_0428	trpD	0000460
s_0457	Anthranilate	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_0783	Diphosphate	
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	

Products

Table 407: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	

Kinetic Law

Derived unit contains undeclared units

$$v_{101} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0457}] \cdot [\mathrm{s\_0360}] - \frac{[\mathrm{s\_0783}] \cdot [\mathrm{s\_1278}]}{\mathrm{Keq}} \right)}{\mathrm{Km0457} \cdot \mathrm{Km0360}}}{\left(1 + \frac{[\mathrm{s\_0457}]}{\mathrm{Km0457}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0360}]}{\mathrm{Km0360}}\right) + \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1278}]}{\mathrm{Km1278}}\right) - 1} \tag{203}$$

Table 408: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	☑
Vmax		0000324	0.110	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0457		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0360		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1278		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.102 Reaction r_0349

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name anthranilate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0526} + \text{s\_1101} \xrightleftharpoons{\text{e\_0429, e\_0428, s\_0526, s\_1101, s\_0457, s\_1095, s\_1531}} \text{s\_0457} + \text{s\_1095} + \text{s\_1531} \quad (204)$$

Reactants

Table 409: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	
s_1101	L-Glutamine	

Modifiers

Table 410: Properties of each modifier.

Id	Name	SBO
e_0429	trpE	0000460
e_0428	trpD	0000460
s_0526	chorismate	
s_1101	L-Glutamine	
s_0457	Anthranilate	
s_1095	L-Glutamate	
s_1531	Pyruvate	

Products

Table 411: Properties of each product.

Id	Name	SBO
s_0457	Anthranilate	
s_1095	L-Glutamate	

Id	Name	SBO
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{102} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0526}] \cdot [\text{s\_1101}] - \frac{[\text{s\_0457}] \cdot [\text{s\_1095}] \cdot [\text{s\_1531}]}{\text{Keq}} \right)}{\text{Km0526} \cdot \text{Km1101}}}{\left(1 + \frac{[\text{s\_0526}]}{\text{Km0526}}\right) \cdot \left(1 + \frac{[\text{s\_1101}]}{\text{Km1101}}\right) + \left(1 + \frac{[\text{s\_0457}]}{\text{Km0457}}\right) \cdot \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) - 1} \tag{205}$$

Table 412: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	☑
Vmax		0000324	0.173	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0526		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0457		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1095		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.103 Reaction r_0355

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name arabinose-5-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0704} \xrightleftharpoons{\text{e\_0993, e\_0848, s\_0704, s\_0611}} \text{s\_0611} \tag{206}$$

Reactant

Table 413: Properties of each reactant.

Id	Name	SBO
s_0704	D-Ribulose 5-phosphate	

Modifiers

Table 414: Properties of each modifier.

Id	Name	SBO
e_0993	kdsD	0000460
e_0848	gutQ	0000460
s_0704	D-Ribulose 5-phosphate	
s_0611	D-Arabinose 5-phosphate	

Product

Table 415: Properties of each product.

Id	Name	SBO
s_0611	D-Arabinose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{103} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0704}] - \frac{[\text{s\_0611}]}{\text{Keq}} \right)}{\text{Km0704}}}{1 + \frac{[\text{s\_0704}]}{\text{Km0704}} + 1 + \frac{[\text{s\_0611}]}{\text{Km0611}} - 1} \tag{207}$$

Table 416: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	☑
Vmax		0000324	0.032	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0704		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0611		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.104 Reaction r_0360

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name argininosuccinate lyase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1274} \xrightleftharpoons{\text{e\_1244, s\_1274, s\_1061, s\_0875}} \text{s\_1061} + \text{s\_0875} \tag{208}$$

Reactant

Table 417: Properties of each reactant.

Id	Name	SBO
s_1274	N(omega)-(L-Arginino)succinate	

Modifiers

Table 418: Properties of each modifier.

Id	Name	SBO
e_1244	argH	0000460
s_1274	N(omega)-(L-Arginino)succinate	
s_1061	L-Arginine	
s_0875	Fumarate	

Products

Table 419: Properties of each product.

Id	Name	SBO
s_1061	L-Arginine	
s_0875	Fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{104} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1274}] - \frac{[\text{s\_1061}] \cdot [\text{s\_0875}]}{\text{Keq}} \right)}{\text{Km1274}}}{1 + \frac{[\text{s\_1274}]}{\text{Km1274}} + \left(1 + \frac{[\text{s\_1061}]}{\text{Km1061}}\right) \cdot \left(1 + \frac{[\text{s\_0875}]}{\text{Km0875}}\right) - 1} \tag{209}$$

Table 420: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.410	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1274		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1061		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0875		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.105 Reaction r_0361

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name argininosuccinate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1072} + \text{s\_0467} + \text{s\_1081} \xrightleftharpoons{\text{e\_0986, s\_1072, s\_0467, s\_1081, s\_0454, s\_1274, s\_0783}} \text{s\_0454} + \text{s\_1274} + \text{s\_0783} \tag{210}$$

Reactants

Table 421: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0467	ATP	
s_1081	L-Citrulline	

Modifiers

Table 422: Properties of each modifier.

Id	Name	SBO
e_0986	argG	0000460
s_1072	L-Aspartate	
s_0467	ATP	
s_1081	L-Citrulline	
s_0454	AMP	
s_1274	N(omega)-(L-Arginino)succinate	
s_0783	Diphosphate	

Products

Table 423: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1274	N(omega)-(L-Arginino)succinate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{105} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1072}] \cdot [\mathrm{s\_0467}] \cdot [\mathrm{s\_1081}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_1274}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km1072} \cdot \mathrm{Km0467} \cdot \mathrm{Km1081}}}{\left(1 + \frac{[\mathrm{s\_1072}]}{\mathrm{Km1072}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1081}]}{\mathrm{Km1081}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1274}]}{\mathrm{Km1274}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{211}$$

Table 424: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	1.229	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1072		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1081		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0454		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1274		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.106 Reaction r_0365

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name asparagine synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1072} + \mathrm{s\_0467} + \mathrm{s\_0451} \xrightleftharpoons{\mathrm{e\_1160},\ \mathrm{s\_1072},\ \mathrm{s\_0467},\ \mathrm{s\_0451},\ \mathrm{s\_0454},\ \mathrm{s\_1068},\ \mathrm{s\_0783}} \mathrm{s\_0454} + \mathrm{s\_1068} + \mathrm{s\_0783} \quad (212)$$

Reactants

Table 425: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0467	ATP	
s_0451	Ammonium	

Modifiers

Table 426: Properties of each modifier.

Id	Name	SBO
e_1160	asnA	0000460
s_1072	L-Aspartate	
s_0467	ATP	
s_0451	Ammonium	
s_0454	AMP	
s_1068	L-Asparagine	
s_0783	Diphosphate	

Products

Table 427: Properties of each product.

Id	Name	SBO
s_0454	AMP	

Id	Name	SBO
s_1068	L-Asparagine	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{106} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1072}] \cdot [\text{s\_0467}] \cdot [\text{s\_0451}] - \frac{[\text{s\_0454}] \cdot [\text{s\_1068}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km1072} \cdot \text{Km0467} \cdot \text{Km0451}}}{\left(1 + \frac{[\text{s\_1072}]}{\text{Km1072}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0451}]}{\text{Km0451}}\right) + \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) \cdot \left(1 + \frac{[\text{s\_1068}]}{\text{Km1068}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{213}$$

Table 428: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.033	dimensionless	☑
Vmax		0000324	1.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0451		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1068		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.107 Reaction r_0367

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name aspartate 1-decarboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1072} \xrightleftharpoons{\text{e\_0061, s\_1072, s\_0470, s\_0543}} \text{s\_0470} + \text{s\_0543} \tag{214}$$

Reactant

Table 429: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	

Modifiers

Table 430: Properties of each modifier.

Id	Name	SBO
e_0061	panD	0000460
s_1072	L-Aspartate	
s_0470	beta-Alanine	
s_0543	CO2	

Products

Table 431: Properties of each product.

Id	Name	SBO
s_0470	beta-Alanine	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{107} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1072}] - \frac{[\text{s\_0470}] \cdot [\text{s\_0543}]}{\text{Keq}} \right)}{\text{Km1072}}}{1 + \frac{[\text{s\_1072}]}{\text{Km1072}} + \left(1 + \frac{[\text{s\_0470}]}{\text{Km0470}}\right) \cdot \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) - 1} \tag{215}$$

Table 432: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388811725 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$7.97856388811725 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0470		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.108 Reaction r_0368

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name aspartate carbamoyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1072} + \text{s\_0502} \xrightleftharpoons{\text{e\_1340, e\_1339, s\_1072, s\_0502, s\_1312, s\_1430}} \text{s\_1312} + \text{s\_1430} \qquad (216)$$

Reactants

Table 433: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0502	Carbamoyl phosphate	

Modifiers

Table 434: Properties of each modifier.

Id	Name	SBO
e_1340	pyrB	0000460
e_1339	pyrI	0000460
s_1072	L-Aspartate	
s_0502	Carbamoyl phosphate	
s_1312	N-Carbamoyl-L-aspartate	
s_1430	Phosphate	

Products

Table 435: Properties of each product.

Id	Name	SBO
s_1312	N-Carbamoyl-L-aspartate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{108} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1072}] \cdot [\mathrm{s\_0502}] - \frac{[\mathrm{s\_1312}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km1072} \cdot \mathrm{Km0502}}}{\left(1 + \frac{[\mathrm{s\_1072}]}{\mathrm{Km1072}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0502}]}{\mathrm{Km0502}}\right) + \left(1 + \frac{[\mathrm{s\_1312}]}{\mathrm{Km1312}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{217}$$

Table 436: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	☑
Vmax		0000324	0.641	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1072		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0502		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1312		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.109 Reaction r_0369

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name aspartate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1072} + \mathrm{s\_0467} \xrightleftharpoons{\mathrm{e\_1263,\ e\_0001,\ e\_1233,\ s\_1072,\ s\_0467,\ s\_0332,\ s\_0421}} \mathrm{s\_0332} + \mathrm{s\_0421} \tag{218}$$

Reactants

Table 437: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0467	ATP	

Modifiers

Table 438: Properties of each modifier.

Id	Name	SBO
e_1263	lysC	0000460
e_0001	thrA	0000460
e_1233	metL	0000460
s_1072	L-Aspartate	
s_0467	ATP	
s_0332	4-Phospho-L-aspartate	
s_0421	ADP	

Products

Table 439: Properties of each product.

Id	Name	SBO
s_0332	4-Phospho-L-aspartate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{109} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1072}] \cdot [\text{s\_0467}] - \frac{[\text{s\_0332}] \cdot [\text{s\_0421}]}{\text{Keq}} \right)}{\text{Km1072} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_1072}]}{\text{Km1072}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_0332}]}{\text{Km0332}}\right) \cdot \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) - 1} \tag{219}$$

Table 440: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.231	dimensionless	☑
Vmax		0000324	3.233	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0332		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.110 Reaction r_0370

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name aspartate transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1095} + \text{s\_1399} \xrightleftharpoons{\text{e\_0332, s\_1095, s\_1399, s\_0233, s\_1072}} \text{s\_0233} + \text{s\_1072} \tag{220}$$

Reactants

Table 441: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1399	Oxaloacetate	

Modifiers

Table 442: Properties of each modifier.

Id	Name	SBO
e_0332	aspC	0000460
s_1095	L-Glutamate	
s_1399	Oxaloacetate	
s_0233	2-Oxoglutarate	
s_1072	L-Aspartate	

Products

Table 443: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1072	L-Aspartate	

Kinetic Law

Derived unit contains undeclared units

$$v_{110} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1095}] \cdot [\text{s\_1399}] - \frac{[\text{s\_0233}] \cdot [\text{s\_1072}]}{\text{Keq}} \right)}{\text{Km1095} \cdot \text{Km1399}}}{\left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) \cdot \left(1 + \frac{[\text{s\_1399}]}{\text{Km1399}}\right) + \left(1 + \frac{[\text{s\_0233}]}{\text{Km0233}}\right) \cdot \left(1 + \frac{[\text{s\_1072}]}{\text{Km1072}}\right) - 1} \tag{221}$$

Table 444: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.487	dimensionless	☑
Vmax		0000324	6.819	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1399		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1072		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.111 Reaction r_0371

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name aspartate-semialdehyde dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0332} + \text{s\_1336} \xrightleftharpoons{\text{e\_1045, s\_0332, s\_1336, s\_1075, s\_1335, s\_1430}} \text{s\_1075} + \text{s\_1335} + \text{s\_1430} \tag{222}$$

Reactants

Table 445: Properties of each reactant.

Id	Name	SBO
s_0332	4-Phospho-L-aspartate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 446: Properties of each modifier.

Id	Name	SBO
e_1045	asd	0000460
s_0332	4-Phospho-L-aspartate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1075	L-Aspartate 4-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Products

Table 447: Properties of each product.

Id	Name	SBO
s_1075	L-Aspartate 4-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{111} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0332}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_1075}] \cdot [\mathrm{s\_1335}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0332} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0332}]}{\mathrm{Km0332}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_1075}]}{\mathrm{Km1075}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{223}$$

Table 448: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.231	dimensionless	☑
Vmax		0000324	5.081	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0332		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1075		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.112 Reaction r_0374

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ATP phosphoribosyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0360} \xrightleftharpoons{\text{e\_0605, s\_0467, s\_0360, s\_0783, s\_0099}} \text{s\_0783} + \text{s\_0099} \tag{224}$$

Reactants

Table 449: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 450: Properties of each modifier.

Id	Name	SBO
e_0605	hisG	0000460
s_0467	ATP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_0783	Diphosphate	
s_0099	1-(5-Phosphoribosyl)-ATP	

Products

Table 451: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_0099	1-(5-Phosphoribosyl)-ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{112} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0360}] - \frac{[\text{s\_0783}] \cdot [\text{s\_0099}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0360}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0360}]}{\text{Km0360}}\right) + \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) \cdot \left(1 + \frac{[\text{s\_0099}]}{\text{Km0099}}\right) - 1} \tag{225}$$

Table 452: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.184	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0360		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0099		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.113 Reaction r_0383

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name Biotin synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0378} + \text{s\_1552} + \text{s\_0755} \xrightleftharpoons{\text{e\_0275, s\_0378, s\_1552, s\_0755, s\_0377, s\_0476, s\_0333, s\_1141}} \text{s\_0377} + \text{s\_0476} + \text{s\_033} \tag{226}$$

Reactants

Table 453: Properties of each reactant.

Id	Name	SBO
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1552	S-Adenosyl-L-methionine	
s_0755	Dethiobiotin	

Modifiers

Table 454: Properties of each modifier.

Id	Name	SBO
e_0275	bioB	0000460
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1552	S-Adenosyl-L-methionine	
s_0755	Dethiobiotin	
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	
s_0476	Biotin	
s_0333	5'-Deoxyadenosine	
s_1141	L-Methionine	

Products

Table 455: Properties of each product.

Id	Name	SBO
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	
s_0476	Biotin	
s_0333	5'-Deoxyadenosine	
s_1141	L-Methionine	

Kinetic Law

Derived unit contains undeclared units

$$v_{113} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0378}] \cdot [\text{s\_1552}] \cdot [\text{s\_0755}] - \frac{[\text{s\_0377}] \cdot [\text{s\_0476}] \cdot [\text{s\_0333}] \cdot [\text{s\_1141}]}{\text{Keq}} \right)}{\text{Km0378} \cdot \text{Km1552} \cdot \text{Km0755}}}{\left(1 + \frac{[\text{s\_0378}]}{\text{Km0378}}\right) \cdot \left(1 + \frac{[\text{s\_1552}]}{\text{Km1552}}\right) \cdot \left(1 + \frac{[\text{s\_0755}]}{\text{Km0755}}\right) + \left(1 + \frac{[\text{s\_0377}]}{\text{Km0377}}\right) \cdot \left(1 + \frac{[\text{s\_0476}]}{\text{Km0476}}\right) \cdot \left(1 + \frac{[\text{s\_0333}]}{\text{Km0333}}\right) \cdot \left(1 + \frac{[\text{s\_1141}]}{\text{Km1141}}\right) -} \quad (227)$$

Table 456: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$1.27435395226989 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0378		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1552		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0755		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0377		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0476		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0333		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1141		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.114 Reaction r_0384

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name bis-molybdenum cofactor synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1264} + \mathrm{s\_0420} \xrightleftharpoons{\mathrm{e\_0292},\ \mathrm{s\_1264},\ \mathrm{s\_0420},\ \mathrm{s\_0454},\ \mathrm{s\_0479},\ \mathrm{s\_0579}} \mathrm{s\_0454} + \mathrm{s\_0479} + \mathrm{s\_0579} \tag{228}$$

Reactants

Table 457: Properties of each reactant.

Id	Name	SBO
s_1264	molybdenum cofactor	
s_0420	adenylated molybdopterin	

Modifiers

Table 458: Properties of each modifier.

Id	Name	SBO
e_0292	moeA	0000460
s_1264	molybdenum cofactor	
s_0420	adenylated molybdopterin	
s_0454	AMP	
s_0479	bis-molybdenum cofactor	
s_0579	Cu2+	

Products

Table 459: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0479	bis-molybdenum cofactor	
s_0579	Cu2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{114} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1264}] \cdot [\text{s\_0420}] - \frac{[\text{s\_0454}] \cdot [\text{s\_0479}] \cdot [\text{s\_0579}]}{\text{Keq}} \right)}{\text{Km1264} \cdot \text{Km0420}}}{\left(1 + \frac{[\text{s\_1264}]}{\text{Km1264}}\right) \cdot \left(1 + \frac{[\text{s\_0420}]}{\text{Km0420}}\right) + \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) \cdot \left(1 + \frac{[\text{s\_0479}]}{\text{Km0479}}\right) \cdot \left(1 + \frac{[\text{s\_0579}]}{\text{Km0579}}\right) - 1} \tag{229}$$

Table 460: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.71778914548703 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1264		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0420		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0479		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0579		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.115 Reaction r_0385

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name bis-molybdopterin guanine dinucleotide synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0481} + \text{s\_0945} \xrightleftharpoons{\text{e\_1207, e\_1206, s\_0481, s\_0945, s\_0480, s\_0783}} \text{s\_0480} + \text{s\_0783} \tag{230}$$

Reactants

Table 461: Properties of each reactant.

Id	Name	SBO
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0945	GTP	

Modifiers

Table 462: Properties of each modifier.

Id	Name	SBO
e_1207	mobA	0000460
e_1206	mobB	0000460
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0945	GTP	
s_0480	bis-molybdopterin guanine dinucleotide	
s_0783	Diphosphate	

Products

Table 463: Properties of each product.

Id	Name	SBO
s_0480	bis-molybdopterin guanine dinucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{115} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0481}] \cdot [\text{s\_0945}] - \frac{[\text{s\_0480}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0481} \cdot \text{Km0945}}}{\left(1 + \frac{[\text{s\_0481}]}{\text{Km0481}}\right) \cdot \left(1 + \frac{[\text{s\_0945}]}{\text{Km0945}}\right) + \left(1 + \frac{[\text{s\_0480}]}{\text{Km0480}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{231}$$

Table 464: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$2.36586581985538 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0481		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0945		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0480		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.116 Reaction r_0386

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name bis-molybdopterin guanine dinucleotide synthase (single GDP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0479} + \mathrm{s\_0945} \xrightleftharpoons{\mathrm{e\_1207},\ \mathrm{e\_1206},\ \mathrm{s\_0479},\ \mathrm{s\_0945},\ \mathrm{s\_0481},\ \mathrm{s\_0783}} \mathrm{s\_0481} + \mathrm{s\_0783} \qquad (232)$$

Reactants

Table 465: Properties of each reactant.

Id	Name	SBO
s_0479	bis-molybdenum cofactor	
s_0945	GTP	

Modifiers

Table 466: Properties of each modifier.

Id	Name	SBO
e_1207	mobA	0000460
e_1206	mobB	0000460
s_0479	bis-molybdenum cofactor	
s_0945	GTP	
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0783	Diphosphate	

Products

Table 467: Properties of each product.

Id	Name	SBO
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{116} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0479}] \cdot [\text{s\_0945}] - \frac{[\text{s\_0481}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0479} \cdot \text{Km0945}}}{\left(1 + \frac{[\text{s\_0479}]}{\text{Km0479}}\right) \cdot \left(1 + \frac{[\text{s\_0945}]}{\text{Km0945}}\right) + \left(1 + \frac{[\text{s\_0481}]}{\text{Km0481}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{233}$$

Table 468: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$2.36586581985538 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0479		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0945		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0481		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.117 Reaction r_0388

This is a reversible reaction of three reactants forming two products influenced by eight modifiers.

Name Carbamate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0543} + \text{s\_0451} \xrightleftharpoons{\text{e\_0903, e\_0183, e\_0110, s\_0467, s\_0543, s\_0451, s\_0421, s\_0502}} \text{s\_0421} + \text{s\_0502} \tag{234}$$

Reactants

Table 469: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0543	CO2	
s_0451	Ammonium	

Modifiers

Table 470: Properties of each modifier.

Id	Name	SBO
e_0903	yqeA	0000460
e_0183	arcC	0000460
e_0110	yahI	0000460
s_0467	ATP	
s_0543	CO2	
s_0451	Ammonium	
s_0421	ADP	
s_0502	Carbamoyl phosphate	

Products

Table 471: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0502	Carbamoyl phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{117} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0543}] \cdot [\mathrm{s\_0451}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0502}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0543} \cdot \mathrm{Km0451}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0451}]}{\mathrm{Km0451}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0502}]}{\mathrm{Km0502}}\right) - 1} \tag{235}$$

Table 472: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.087	dimensionless	☑
Vmax		0000324	1.909	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	20.000	$\mathrm{mmol}^{-1} \cdot 1$	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0451		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0502		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.118 Reaction r_0418

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name CDP-diacylglycerol synthetase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0575} + \mathrm{s\_0075} \xrightleftharpoons{\mathrm{e\_0080},\ \mathrm{s\_0575},\ \mathrm{s\_0075},\ \mathrm{s\_0513},\ \mathrm{s\_0783}} \mathrm{s\_0513} + \mathrm{s\_0783} \tag{236}$$

Reactants

Table 473: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	

Modifiers

Table 474: Properties of each modifier.

Id	Name	SBO
e_0080	cdsA	0000460
s_0575	CTP	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_0783	Diphosphate	

Products

Table 475: Properties of each product.

Id	Name	SBO
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{118} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0575}] \cdot [\text{s\_0075}] - \frac{[\text{s\_0513}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0575} \cdot \text{Km0075}}}{\left(1 + \frac{[\text{s\_0575}]}{\text{Km0575}}\right) \cdot \left(1 + \frac{[\text{s\_0075}]}{\text{Km0075}}\right) + \left(1 + \frac{[\text{s\_0513}]}{\text{Km0513}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{237}$$

Table 476: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	☑
Vmax		0000324	0.124	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0575		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0075		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0513		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.119 Reaction r_0419

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name CDP-diacylglycerol synthetase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0575} + \text{s\_0073} \xrightleftharpoons{\text{e\_0080, s\_0575, s\_0073, s\_0512, s\_0783}} \text{s\_0512} + \text{s\_0783} \tag{238}$$

Reactants

Table 477: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	

Modifiers

Table 478: Properties of each modifier.

Id	Name	SBO
e_0080	cdsA	0000460
s_0575	CTP	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	
s_0783	Diphosphate	

Products

Table 479: Properties of each product.

Id	Name	SBO
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{119} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0575}] \cdot [\mathrm{s\_0073}] - \frac{[\mathrm{s\_0512}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0575} \cdot \mathrm{Km0073}}}{\left(1 + \frac{[\mathrm{s\_0575}]}{\mathrm{Km0575}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0073}]}{\mathrm{Km0073}}\right) + \left(1 + \frac{[\mathrm{s\_0512}]}{\mathrm{Km0512}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{239}$$

Table 480: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	☑
Vmax		0000324	0.146	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0575		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0073		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0512		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.120 Reaction r_0423

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name chorismate mutase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0526} \xrightleftharpoons{\mathrm{e\_0825,\ e\_0826,\ s\_0526,\ s\_1497}} \mathrm{s\_1497} \tag{240}$$

Reactant

Table 481: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	

Modifiers

Table 482: Properties of each modifier.

Id	Name	SBO
e_0825	pheA	0000460
e_0826	tyrA	0000460
s_0526	chorismate	
s_1497	Prephenate	

Product

Table 483: Properties of each product.

Id	Name	SBO
s_1497	Prephenate	

Kinetic Law

Derived unit contains undeclared units

$$v_{120} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0526}] - \frac{[\text{s\_1497}]}{\text{Keq}} \right)}{\text{Km0526}}}{1 + \frac{[\text{s\_0526}]}{\text{Km0526}} + 1 + \frac{[\text{s\_1497}]}{\text{Km1497}} - 1} \tag{241}$$

Table 484: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.045	dimensionless	☑
Vmax		0000324	0.269	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0526		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1497		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.121 Reaction r_0424

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Chorismate pyruvate lyase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0526} \xrightleftharpoons{\text{e\_1271, s\_0526, s\_0325, s\_1531}} \text{s\_0325} + \text{s\_1531} \tag{242}$$

Reactant

Table 485: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	

Modifiers

Table 486: Properties of each modifier.

Id	Name	SBO
e_1271	ubiC	0000460

Id	Name	SBO
s_0526	chorismate	
s_0325	4-Hydroxybenzoate	
s_1531	Pyruvate	

Products

Table 487: Properties of each product.

Id	Name	SBO
s_0325	4-Hydroxybenzoate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{121} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0526}] - \frac{[\text{s\_0325}] \cdot [\text{s\_1531}]}{\text{Keq}} \right)}{\text{Km0526}}}{1 + \frac{[\text{s\_0526}]}{\text{Km0526}} + \left(1 + \frac{[\text{s\_0325}]}{\text{Km0325}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) - 1} \tag{243}$$

Table 488: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.08892317229363 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0526		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0325		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.122 Reaction r_0425

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name chorismate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0359} \xrightleftharpoons{\text{e\_0734, s\_0359, s\_0526, s\_1430}} \text{s\_0526} + \text{s\_1430} \tag{244}$$

Reactant

Table 489: Properties of each reactant.

Id	Name	SBO
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	

Modifiers

Table 490: Properties of each modifier.

Id	Name	SBO
e_0734	aroC	0000460
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	
s_0526	chorismate	
s_1430	Phosphate	

Products

Table 491: Properties of each product.

Id	Name	SBO
s_0526	chorismate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{122} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0359}] - \frac{[\text{s\_0526}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0359}}}{1 + \frac{[\text{s\_0359}]}{\text{Km0359}} + \left(1 + \frac{[\text{s\_0526}]}{\text{Km0526}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{245}$$

Table 492: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	☑
Vmax		0000324	0.528	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0359		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0526		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.123 Reaction r_0428

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name citrate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0395} + \mathrm{s\_1399} \xrightleftharpoons{\mathrm{e\_0246,\ s\_0395,\ s\_1399,\ s\_0536,\ s\_0555}} \mathrm{s\_0536} + \mathrm{s\_0555} \qquad (246)$$

Reactants

Table 493: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1399	Oxaloacetate	

Modifiers

Table 494: Properties of each modifier.

Id	Name	SBO
e_0246	gltA	0000460
s_0395	Acetyl-CoA	
s_1399	Oxaloacetate	
s_0536	Citrate	
s_0555	Coenzyme A	

Products

Table 495: Properties of each product.

Id	Name	SBO
s_0536	Citrate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{123} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0395}] \cdot [\mathrm{s\_1399}] - \frac{[\mathrm{s\_0536}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0395} \cdot \mathrm{Km1399}}}{\left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1399}]}{\mathrm{Km1399}}\right) + \left(1 + \frac{[\mathrm{s\_0536}]}{\mathrm{Km0536}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{247}$$

Table 496: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	☑
Vmax		0000324	2.085	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1399		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0536		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0555		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.124 Reaction r_0436

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name coproporphyrinogen oxidase (O2 required)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0565} + \mathrm{s\_1372} \xrightleftharpoons{\mathrm{e\_0765,\ s\_0565,\ s\_1372,\ s\_0543,\ s\_1512}} 2\,\mathrm{s\_0543} + \mathrm{s\_1512} \tag{248}$$

Reactants

Table 497: Properties of each reactant.

Id	Name	SBO
s_0565	Coproporphyrinogen III	
s_1372	O2	

Modifiers

Table 498: Properties of each modifier.

Id	Name	SBO
e_0765	hemF	0000460
s_0565	Coproporphyrinogen III	
s_1372	O2	
s_0543	CO2	
s_1512	Protoporphyrinogen IX	

Products

Table 499: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1512	Protoporphyrinogen IX	

Kinetic Law

Derived unit contains undeclared units

$$v_{124} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0565}] \cdot [\mathrm{s\_1372}] - \frac{[\mathrm{s\_0543}]^2 \cdot [\mathrm{s\_1512}]}{\mathrm{Keq}} \right)}{\mathrm{Km0565} \cdot \mathrm{Km1372}}}{\left(1 + \frac{[\mathrm{s\_0565}]}{\mathrm{Km0565}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1372}]}{\mathrm{Km1372}}\right) + \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_1512}]}{\mathrm{Km1512}}\right) - 1} \quad (249)$$

Table 500: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317225085 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.79563097895187 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0565		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1372		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1512		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.125 Reaction r_0440

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name CTP synthase (glutamine)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_1101} + \mathrm{s\_1792} \xrightleftharpoons[(250)]{\mathrm{e\_0876},\ \mathrm{s\_0467},\ \mathrm{s\_1101},\ \mathrm{s\_1792},\ \mathrm{s\_0421},\ \mathrm{s\_0575},\ \mathrm{s\_1095},\ \mathrm{s\_1430}} \mathrm{s\_0421} + \mathrm{s\_0575} + \mathrm{s\_109}$$

Reactants

Table 501: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1101	L-Glutamine	
s_1792	UTP	

Modifiers

Table 502: Properties of each modifier.

Id	Name	SBO
e_0876	pyrG	0000460
s_0467	ATP	
s_1101	L-Glutamine	
s_1792	UTP	
s_0421	ADP	
s_0575	CTP	
s_1095	L-Glutamate	
s_1430	Phosphate	

Products

Table 503: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0575	CTP	
s_1095	L-Glutamate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{125} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1101}] \cdot [\text{s\_1792}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0575}] \cdot [\text{s\_1095}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1101} \cdot \text{Km1792}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1101}]}{\text{Km1101}}\right) \cdot \left(1 + \frac{[\text{s\_1792}]}{\text{Km1792}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0575}]}{\text{Km0575}}\right) \cdot \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) -} \quad (251)$$

Table 504: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.022	dimensionless	☑
Vmax		0000324	1.023	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1792		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0575		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1095		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.126 Reaction r_0445

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name cyclic pyranopterin monophosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0945} \xrightleftharpoons{\text{e\_0279, e\_0280, s\_0945, s\_0585, s\_0783}} \text{s\_0585} + \text{s\_0783} \tag{252}$$

Reactant

Table 505: Properties of each reactant.

Id	Name	SBO
s_0945	GTP	

Modifiers

Table 506: Properties of each modifier.

Id	Name	SBO
e_0279	moaA	0000460
e_0280	moaC	0000460
s_0945	GTP	
s_0585	cyclic pyranopterin monophosphate	
s_0783	Diphosphate	

Products

Table 507: Properties of each product.

Id	Name	SBO
s_0585	cyclic pyranopterin monophosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{126} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0945}] - \frac{[\text{s\_0585}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0945}}}{1 + \frac{[\text{s\_0945}]}{\text{Km0945}} + \left(1 + \frac{[\text{s\_0585}]}{\text{Km0585}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{253}$$

Table 508: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.37980831407913 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.37980831407913 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0945		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0585		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.127 Reaction r_0450

This is a reversible reaction of one reactant forming three products influenced by six modifiers.

Name cystathionine b-lyase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1082} \xrightleftharpoons{\mathrm{e\_0951},\ \mathrm{e\_0519},\ \mathrm{s\_1082},\ \mathrm{s\_1112},\ \mathrm{s\_0451},\ \mathrm{s\_1531}} \mathrm{s\_1112} + \mathrm{s\_0451} + \mathrm{s\_1531} \qquad (254)$$

Reactant

Table 509: Properties of each reactant.

Id	Name	SBO
s_1082	L-Cystathionine	

Modifiers

Table 510: Properties of each modifier.

Id	Name	SBO
e_0951	metC	0000460
e_0519	malY	0000460
s_1082	L-Cystathionine	
s_1112	L-Homocysteine	
s_0451	Ammonium	
s_1531	Pyruvate	

Products

Table 511: Properties of each product.

Id	Name	SBO
s_1112	L-Homocysteine	
s_0451	Ammonium	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{127} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1082}] - \frac{[\text{s\_1112}] \cdot [\text{s\_0451}] \cdot [\text{s\_1531}]}{\text{Keq}} \right)}{\text{Km1082}}}{1 + \frac{[\text{s\_1082}]}{\text{Km1082}} + \left(1 + \frac{[\text{s\_1112}]}{\text{Km1112}}\right) \cdot \left(1 + \frac{[\text{s\_0451}]}{\text{Km0451}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) - 1} \tag{255}$$

Table 512: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑
Vmax		0000324	0.384	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	☑
Km1082		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1112		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0451		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.128 Reaction r_0452

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name cysteine synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1358} + \text{s\_0994} \xrightleftharpoons{\text{e\_0757, e\_0750, s\_1358, s\_0994, s\_0384, s\_1083}} \text{s\_0384} + \text{s\_1083} \tag{256}$$

Reactants

Table 513: Properties of each reactant.

Id	Name	SBO
s_1358	O-Acetyl-L-serine	
s_0994	Hydrogen sulfide	

Modifiers

Table 514: Properties of each modifier.

Id	Name	SBO
e_0757	cysM	0000460
e_0750	cysK	0000460
s_1358	O-Acetyl-L-serine	
s_0994	Hydrogen sulfide	
s_0384	Acetate	
s_1083	L-Cysteine	

Products

Table 515: Properties of each product.

Id	Name	SBO
s_0384	Acetate	
s_1083	L-Cysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{128} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1358}] \cdot [\mathrm{s\_0994}] - \frac{[\mathrm{s\_0384}] \cdot [\mathrm{s\_1083}]}{\mathrm{Keq}} \right)}{\mathrm{Km1358} \cdot \mathrm{Km0994}}}{\left(1 + \frac{[\mathrm{s\_1358}]}{\mathrm{Km1358}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0994}]}{\mathrm{Km0994}}\right) + \left(1 + \frac{[\mathrm{s\_0384}]}{\mathrm{Km0384}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1083}]}{\mathrm{Km1083}}\right) - 1} \tag{257}$$

Table 516: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.481	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km1358		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0994		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0384		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1083		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.129 Reaction r_0457

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name cytidylate kinase (CMP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0539} \xrightleftharpoons{\mathrm{e\_0328},\ \mathrm{s\_0467},\ \mathrm{s\_0539},\ \mathrm{s\_0421},\ \mathrm{s\_0510}} \mathrm{s\_0421} + \mathrm{s\_0510} \tag{258}$$

Reactants

Table 517: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0539	CMP	

Modifiers

Table 518: Properties of each modifier.

Id	Name	SBO
e_0328	cmk	0000460
s_0467	ATP	
s_0539	CMP	
s_0421	ADP	
s_0510	CDP	

Products

Table 519: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0510	CDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{129} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0539}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0510}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0539}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0539}]}{\text{Km0539}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0510}]}{\text{Km0510}}\right) - 1} \tag{259}$$

Table 520: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.025	dimensionless	☑
Vmax		0000324	0.351	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0539		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0510		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.130 Reaction r_0463

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name D-alanine-D-alanine ligase (reversible)

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\text{s\_0600} + \text{s\_0467} \xrightleftharpoons{\text{e\_0043, e\_0135, s\_0600, s\_0467, s\_0421, s\_0603, s\_1430}} \text{s\_0421} + \text{s\_0603} + \text{s\_1430} \tag{260}$$

Reactants

Table 521: Properties of each reactant.

Id	Name	SBO
s_0600	D-Alanine	
s_0467	ATP	

Modifiers

Table 522: Properties of each modifier.

Id	Name	SBO
e_0043	ddlB	0000460
e_0135	ddlA	0000460
s_0600	D-Alanine	
s_0467	ATP	
s_0421	ADP	
s_0603	D-Alanyl-D-alanine	
s_1430	Phosphate	

Products

Table 523: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0603	D-Alanyl-D-alanine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{130} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0600}]^2 \cdot [\mathrm{s\_0467}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0603}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0600}^2 \cdot \mathrm{Km0467}}}{\left(1 + \frac{[\mathrm{s\_0600}]}{\mathrm{Km0600}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0603}]}{\mathrm{Km0603}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{261}$$

Table 524: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.115	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0600		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0603		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.131 Reaction r_0488

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dephospho-CoA kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0754} \xrightleftharpoons{\mathrm{e\_0046,\ s\_0467,\ s\_0754,\ s\_0421,\ s\_0555}} \mathrm{s\_0421} + \mathrm{s\_0555} \qquad (262)$$

Reactants

Table 525: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0754	Dephospho-CoA	

Modifiers

Table 526: Properties of each modifier.

Id	Name	SBO
e_0046	coaE	0000460
s_0467	ATP	
s_0754	Dephospho-CoA	
s_0421	ADP	
s_0555	Coenzyme A	

Products

Table 527: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{131} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0754}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0555}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0754}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0754}]}{\text{Km0754}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) - 1} \tag{263}$$

Table 528: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot 1^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0754		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑

6.132 Reaction r_0489

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name dethiobiotin synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0543} + \text{s\_0371} \xrightleftharpoons{\text{e\_0278, s\_0467, s\_0543, s\_0371, s\_0421, s\_0755, s\_1430}} \text{s\_0421} + \text{s\_0755} + \text{s\_1430} \tag{264}$$

Reactants

Table 529: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0543	CO2	
s_0371	7,8-Diaminononanoate	

Modifiers

Table 530: Properties of each modifier.

Id	Name	SBO
e_0278	bioD1	0000460
s_0467	ATP	
s_0543	CO2	
s_0371	7,8-Diaminononanoate	
s_0421	ADP	
s_0755	Dethiobiotin	
s_1430	Phosphate	

Products

Table 531: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0755	Dethiobiotin	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{132} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0543}] \cdot [\mathrm{s\_0371}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0755}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0543} \cdot \mathrm{Km0371}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0371}]}{\mathrm{Km0371}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0755}]}{\mathrm{Km0755}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{265}$$

Table 532: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$8.31100403654277 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0371		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0755		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.133 Reaction r_0498

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name diaminohydroxyphosphoribosylaminopyrimidine deaminase (25drapp)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0160} \xrightleftharpoons{\text{e\_0144, s\_0160, s\_0347, s\_0451}} \text{s\_0347} + \text{s\_0451} \tag{266}$$

Reactant

Table 533: Properties of each reactant.

Id	Name	SBO
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	

Modifiers

Table 534: Properties of each modifier.

Id	Name	SBO
e_0144	ribD	0000460
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_0451	Ammonium	

Products

Table 535: Properties of each product.

Id	Name	SBO
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_0451	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{133} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0160}] - \frac{[\text{s\_0347}] \cdot [\text{s\_0451}]}{\text{Keq}} \right)}{\text{Km0160}}}{1 + \frac{[\text{s\_0160}]}{\text{Km0160}} + \left(1 + \frac{[\text{s\_0347}]}{\text{Km0347}}\right) \cdot \left(1 + \frac{[\text{s\_0451}]}{\text{Km0451}}\right) - 1} \tag{267}$$

Table 536: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.17784634458656 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0160		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0347		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0451		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.134 Reaction r_0499

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name diaminopimelate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1242} \xrightleftharpoons{\text{e\_0897, s\_1242, s\_0543, s\_1131}} \text{s\_0543} + \text{s\_1131} \tag{268}$$

Reactant

Table 537: Properties of each reactant.

Id	Name	SBO
s_1242	meso-2,6-Diaminoheptanedioate	

Modifiers

Table 538: Properties of each modifier.

Id	Name	SBO
e_0897	lysA	0000460
s_1242	meso-2,6-Diaminoheptanedioate	
s_0543	CO2	
s_1131	L-Lysine	

Products

Table 539: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1131	L-Lysine	

Kinetic Law

Derived unit contains undeclared units

$$v_{134} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1242}] - \frac{[\text{s\_0543}] \cdot [\text{s\_1131}]}{\text{Keq}} \right)}{\text{Km1242}}}{1 + \frac{[\text{s\_1242}]}{\text{Km1242}} + \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_1131}]}{\text{Km1131}}\right) - 1} \tag{269}$$

Table 540: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.048	dimensionless	☑
Vmax		0000324	0.475	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1242		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1131		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.135 Reaction r_0500

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name diaminopimelate epimerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1211} \xrightleftharpoons{\text{e\_1189, s\_1211, s\_1242}} \text{s\_1242} \tag{270}$$

Reactant

Table 541: Properties of each reactant.

Id	Name	SBO
s_1211	LL-2,6-Diaminoheptanedioate	

Modifiers

Table 542: Properties of each modifier.

Id	Name	SBO
e_1189	dapF	0000460
s_1211	LL-2,6-Diaminoheptanedioate	
s_1242	meso-2,6-Diaminoheptanedioate	

Product

Table 543: Properties of each product.

Id	Name	SBO
s_1242	meso-2,6-Diaminoheptanedioate	

Kinetic Law

Derived unit contains undeclared units

$$v_{135} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1211}] - \frac{[\text{s\_1242}]}{\text{Keq}} \right)}{\text{Km1211}}}{1 + \frac{[\text{s\_1211}]}{\text{Km1211}} + 1 + \frac{[\text{s\_1242}]}{\text{Km1242}} - 1} \tag{271}$$

Table 544: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	☑
Vmax		0000324	0.308	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1211		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1242		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.136 Reaction r_0501

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydoorotic acid dehydrogenase (quinone8)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0052} + \mathrm{s\_1732} \xrightleftharpoons{\mathrm{e\_0342,\ s\_0052,\ s\_1732,\ s\_1394,\ s\_1731}} \mathrm{s\_1394} + \mathrm{s\_1731} \tag{272}$$

Reactants

Table 545: Properties of each reactant.

Id	Name	SBO
s_0052	(S)-Dihydroorotate	
s_1732	Ubiquinone-8	

Modifiers

Table 546: Properties of each modifier.

Id	Name	SBO
e_0342	pyrD	0000460
s_0052	(S)-Dihydroorotate	
s_1732	Ubiquinone-8	
s_1394	Orotate	
s_1731	Ubiquinol-8	

Products

Table 547: Properties of each product.

Id	Name	SBO
s_1394	Orotate	
s_1731	Ubiquinol-8	

Kinetic Law

Derived unit contains undeclared units

$$v_{136} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0052}] \cdot [\text{s\_1732}] - \frac{[\text{s\_1394}] \cdot [\text{s\_1731}]}{\text{Keq}} \right)}{\text{Km0052} \cdot \text{Km1732}}}{\left(1 + \frac{[\text{s\_0052}]}{\text{Km0052}}\right) \cdot \left(1 + \frac{[\text{s\_1732}]}{\text{Km1732}}\right) + \left(1 + \frac{[\text{s\_1394}]}{\text{Km1394}}\right) \cdot \left(1 + \frac{[\text{s\_1731}]}{\text{Km1731}}\right) - 1} \tag{273}$$

Table 548: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	☑
Vmax		0000324	0.321	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0052		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1732		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1394		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1731		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.137 Reaction r_0502

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydrodipicolinate reductase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0155} + \text{s\_1336} \xrightleftharpoons{\text{e\_0012, s\_0155, s\_1336, s\_1335, s\_0148}} \text{s\_1335} + \text{s\_0148} \tag{274}$$

Reactants

Table 549: Properties of each reactant.

Id	Name	SBO
s_0155	2,3-Dihydrodipicolinate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 550: Properties of each modifier.

Id	Name	SBO
e_0012	dapB	0000460
s_0155	2,3-Dihydrodipicolinate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0148	2,3,4,5-Tetrahydrodipicolinate	

Products

Table 551: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0148	2,3,4,5-Tetrahydrodipicolinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{137} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0155}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_1335}] \cdot [\mathrm{s\_0148}]}{\mathrm{Keq}} \right)}{\mathrm{Km0155} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0155}]}{\mathrm{Km0155}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0148}]}{\mathrm{Km0148}}\right) - 1} \tag{275}$$

Table 552: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	☑
Vmax		0000324	0.719	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0155		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0148		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.138 Reaction r_0503

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name dihydrodipicolinate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1075} + \mathrm{s\_1531} \xrightleftharpoons{\mathrm{e\_0776,\ s\_1075,\ s\_1531,\ s\_0155}} \mathrm{s\_0155} \tag{276}$$

Reactants

Table 553: Properties of each reactant.

Id	Name	SBO
s_1075	L-Aspartate 4-semialdehyde	
s_1531	Pyruvate	

Modifiers

Table 554: Properties of each modifier.

Id	Name	SBO
e_0776	dapA	0000460
s_1075	L-Aspartate 4-semialdehyde	
s_1531	Pyruvate	
s_0155	2,3-Dihydrodipicolinate	

Product

Table 555: Properties of each product.

Id	Name	SBO
s_0155	2,3-Dihydrodipicolinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{138} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1075}] \cdot [\text{s\_1531}] - \frac{[\text{s\_0155}]}{\text{Keq}} \right)}{\text{Km1075} \cdot \text{Km1531}}}{\left(1 + \frac{[\text{s\_1075}]}{\text{Km1075}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) + 1 + \frac{[\text{s\_0155}]}{\text{Km0155}} - 1} \tag{277}$$

Table 556: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	☑
Vmax		0000324	0.514	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km1075		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0155		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.139 Reaction r_0504

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name dihydrofolate reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0372} + \text{s\_1336} \xrightleftharpoons{\text{e\_0514, e\_0020, s\_0372, s\_1336, s\_1335, s\_0337}} \text{s\_1335} + \text{s\_0337} \tag{278}$$

Reactants

Table 557: Properties of each reactant.

Id	Name	SBO
s_0372	7,8-Dihydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 558: Properties of each modifier.

Id	Name	SBO
e_0514	folM	0000460
e_0020	folA	0000460
s_0372	7,8-Dihydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 559: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{139} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0372}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_1335}] \cdot [\mathrm{s\_0337}]}{\mathrm{Keq}} \right)}{\mathrm{Km0372} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0372}]}{\mathrm{Km0372}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0337}]}{\mathrm{Km0337}}\right) - 1} \tag{279}$$

Table 560: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.052	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0372		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0337		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.140 Reaction r_0505

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name dihydrofolate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0767} + \text{s\_1095} \xrightleftharpoons{\text{e\_0729, s\_0467, s\_0767, s\_1095, s\_0421, s\_0372, s\_1430}} \text{s\_0421} + \text{s\_0372} + \text{s\_1430} \quad (280)$$

Reactants

Table 561: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0767	Dihydropteroate	
s_1095	L-Glutamate	

Modifiers

Table 562: Properties of each modifier.

Id	Name	SBO
e_0729	folC	0000460
s_0467	ATP	
s_0767	Dihydropteroate	
s_1095	L-Glutamate	
s_0421	ADP	
s_0372	7,8-Dihydrofolate	
s_1430	Phosphate	

Products

Table 563: Properties of each product.

Id	Name	SBO
s_0421	ADP	

Id	Name	SBO
s_0372	7,8-Dihydrofolate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{140} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0767}] \cdot [\mathrm{s\_1095}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0372}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0767} \cdot \mathrm{Km1095}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0767}]}{\mathrm{Km0767}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0372}]}{\mathrm{Km0372}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{281}$$

Table 564: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.003	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0767		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1095		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0372		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.141 Reaction r_0507

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name dihydroneopterin aldolase reversible

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0765} \xrightleftharpoons{\mathrm{e\_0964,\ s\_0765,\ s\_0367,\ s\_0936}} \mathrm{s\_0367} + \mathrm{s\_0936} \tag{282}$$

Reactant

Table 565: Properties of each reactant.

Id	Name	SBO
s_0765	Dihydroneopterin	

Modifiers

Table 566: Properties of each modifier.

Id	Name	SBO
e_0964	folB	0000460
s_0765	Dihydroneopterin	
s_0367	6-hydroxymethyl dihydropterin	
s_0936	Glycolaldehyde	

Products

Table 567: Properties of each product.

Id	Name	SBO
s_0367	6-hydroxymethyl dihydropterin	
s_0936	Glycolaldehyde	

Kinetic Law

Derived unit contains undeclared units

$$v_{141} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0765}] - \frac{[\mathrm{s\_0367}] \cdot [\mathrm{s\_0936}]}{\mathrm{Keq}} \right)}{\mathrm{Km0765}}}{1 + \frac{[\mathrm{s\_0765}]}{\mathrm{Km0765}} + \left(1 + \frac{[\mathrm{s\_0367}]}{\mathrm{Km0367}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0936}]}{\mathrm{Km0936}}\right) - 1} \tag{283}$$

Table 568: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0765		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0367		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0936		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.142 Reaction r_0510

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name Dihydroneopterin triphosphate pyrophosphatase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0191} \xrightleftharpoons{\text{e\_0045, e\_0586, s\_0191, s\_0766, s\_0783}} \text{s\_0766} + \text{s\_0783} \qquad (284)$$

Reactant

Table 569: Properties of each reactant.

Id	Name	SBO
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	

Modifiers

Table 570: Properties of each modifier.

Id	Name	SBO
e_0045	mutT	0000460
e_0586	nudB	0000460
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	
s_0766	Dihydroneopterin monophosphate	
s_0783	Diphosphate	

Products

Table 571: Properties of each product.

Id	Name	SBO
s_0766	Dihydroneopterin monophosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{142} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0191}] - \frac{[\text{s\_0766}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0191}}}{1 + \frac{[\text{s\_0191}]}{\text{Km0191}} + \left(1 + \frac{[\text{s\_0766}]}{\text{Km0766}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{285}$$

Table 572: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0191		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0766		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.143 Reaction r_0511

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name dihydroorotase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1312} \xrightleftharpoons{\text{e\_0368, s\_1312, s\_0052}} \text{s\_0052} \tag{286}$$

Reactant

Table 573: Properties of each reactant.

Id	Name	SBO
s_1312	N-Carbamoyl-L-aspartate	

Modifiers

Table 574: Properties of each modifier.

Id	Name	SBO
e_0368	pyrC	0000460
s_1312	N-Carbamoyl-L-aspartate	
s_0052	(S)-Dihydroorotate	

Product

Table 575: Properties of each product.

Id	Name	SBO
s_0052	(S)-Dihydroorotate	

Kinetic Law

Derived unit contains undeclared units

$$v_{143} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1312}] - \frac{[\text{s\_0052}]}{\text{Keq}} \right)}{\text{Km1312}}}{1 + \frac{[\text{s\_1312}]}{\text{Km1312}} + 1 + \frac{[\text{s\_0052}]}{\text{Km0052}} - 1} \tag{287}$$

Table 576: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	☑
Vmax		0000324	0.275	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1312		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0052		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.144 Reaction r_0512

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydroorotic acid (menaquinone-8)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0052} + \text{s\_1240} \underset{\text{e\_0342, s\_0052, s\_1240, s\_1239, s\_1394}}{\rightleftharpoons} \text{s\_1239} + \text{s\_1394} \tag{288}$$

Reactants

Table 577: Properties of each reactant.

Id	Name	SBO
s_0052	(S)-Dihydroorotate	

Id	Name	SBO
s_1240	Menaquinone 8	

Modifiers

Table 578: Properties of each modifier.

Id	Name	SBO
e_0342	pyrD	0000460
s_0052	(S)-Dihydroorotate	
s_1240	Menaquinone 8	
s_1239	Menaquinol 8	
s_1394	Orotate	

Products

Table 579: Properties of each product.

Id	Name	SBO
s_1239	Menaquinol 8	
s_1394	Orotate	

Kinetic Law

Derived unit contains undeclared units

$$v_{144} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0052}] \cdot [\mathrm{s\_1240}] - \frac{[\mathrm{s\_1239}] \cdot [\mathrm{s\_1394}]}{\mathrm{Keq}} \right)}{\mathrm{Km0052} \cdot \mathrm{Km1240}}}{\left(1 + \frac{[\mathrm{s\_0052}]}{\mathrm{Km0052}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1240}]}{\mathrm{Km1240}}\right) + \left(1 + \frac{[\mathrm{s\_1239}]}{\mathrm{Km1239}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1394}]}{\mathrm{Km1394}}\right) - 1} \tag{289}$$

Table 580: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	☑
Vmax		0000324	0.321	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0052		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1240		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1239		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1394		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.145 Reaction r_0515

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydropteroate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0318} + \text{s\_0368} \xrightleftharpoons{\text{e\_0988, s\_0318, s\_0368, s\_0767, s\_0783}} \text{s\_0767} + \text{s\_0783} \tag{290}$$

Reactants

Table 581: Properties of each reactant.

Id	Name	SBO
s_0318	4-Aminobenzoate	
s_0368	6-hydroxymethyl-dihydropterin pyrophosphate	

Modifiers

Table 582: Properties of each modifier.

Id	Name	SBO
e_0988	folP	0000460
s_0318	4-Aminobenzoate	
s_0368	6-hydroxymethyl-dihydropterin pyrophosphate	
s_0767	Dihydropteroate	
s_0783	Diphosphate	

Products

Table 583: Properties of each product.

Id	Name	SBO
s_0767	Dihydropteroate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{145} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0318}] \cdot [\text{s\_0368}] - \frac{[\text{s\_0767}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0318} \cdot \text{Km0368}}}{\left(1 + \frac{[\text{s\_0318}]}{\text{Km0318}}\right) \cdot \left(1 + \frac{[\text{s\_0368}]}{\text{Km0368}}\right) + \left(1 + \frac{[\text{s\_0767}]}{\text{Km0767}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{291}$$

Table 584: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0318		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0368		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0767		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.146 Reaction r_0517

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylbutanoate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0017} \xrightleftharpoons{\text{e\_1168, s\_0017, s\_0282}} \text{s\_0282} \tag{292}$$

Reactant

Table 585: Properties of each reactant.

Id	Name	SBO
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	

Modifiers

Table 586: Properties of each modifier.

Id	Name	SBO
e_1168	ilvD	0000460
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	

Product

Table 587: Properties of each product.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{146} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0017}] - \frac{[\text{s\_0282}]}{\text{Keq}} \right)}{\text{Km0017}}}{1 + \frac{[\text{s\_0017}]}{\text{Km0017}} + 1 + \frac{[\text{s\_0282}]}{\text{Km0282}} - 1} \tag{293}$$

Table 588: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	☑
Vmax		0000324	0.727	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0017		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0282		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.147 Reaction r_0518

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name Dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylpentanoate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0018} \xrightleftharpoons{\text{e\_1168, s\_0018, s\_0051}} \text{s\_0051} \tag{294}$$

Reactant

Table 589: Properties of each reactant.

Id	Name	SBO
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	

Modifiers

Table 590: Properties of each modifier.

Id	Name	SBO
e_1168	ilvD	0000460
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	
s_0051	(S)-3-Methyl-2-oxopentanoate	

Product

Table 591: Properties of each product.

Id	Name	SBO
s_0051	(S)-3-Methyl-2-oxopentanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{147} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0018}] - \frac{[\mathrm{s\_0051}]}{\mathrm{Keq}} \right)}{\mathrm{Km0018}}}{1 + \frac{[\mathrm{s\_0018}]}{\mathrm{Km0018}} + 1 + \frac{[\mathrm{s\_0051}]}{\mathrm{Km0051}} - 1} \tag{295}$$

Table 592: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	☑
Vmax		0000324	0.241	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0018		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0051		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.148 Reaction r_0522

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dimethylallyltranstransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0779} + \text{s\_1028} \xrightleftharpoons{\text{e\_0150, s\_0779, s\_1028, s\_0903, s\_0783}} \text{s\_0903} + \text{s\_0783} \tag{296}$$

Reactants

Table 593: Properties of each reactant.

Id	Name	SBO
s_0779	Dimethylallyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 594: Properties of each modifier.

Id	Name	SBO
e_0150	ispA	0000460
s_0779	Dimethylallyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0903	Geranyl diphosphate	
s_0783	Diphosphate	

Products

Table 595: Properties of each product.

Id	Name	SBO
s_0903	Geranyl diphosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{148} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0779}] \cdot [\text{s\_1028}] - \frac{[\text{s\_0903}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0779} \cdot \text{Km1028}}}{\left(1 + \frac{[\text{s\_0779}]}{\text{Km0779}}\right) \cdot \left(1 + \frac{[\text{s\_1028}]}{\text{Km1028}}\right) + \left(1 + \frac{[\text{s\_0903}]}{\text{Km0903}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{297}$$

Table 596: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.85076521030325 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$5.39107129442455 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0779		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1028		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0903		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.149 Reaction r_0532

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dTMP kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0802} \xrightleftharpoons{\text{e\_0378, s\_0467, s\_0802, s\_0421, s\_0795}} \text{s\_0421} + \text{s\_0795} \tag{298}$$

Reactants

Table 597: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0802	dTMP	

Modifiers

Table 598: Properties of each modifier.

Id	Name	SBO
e_0378	tmk	0000460

Id	Name	SBO
s_0467	ATP	
s_0802	dTMP	
s_0421	ADP	
s_0795	dTDP	

Products

Table 599: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0795	dTDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{149} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0802}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0795}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0802}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0802}]}{\text{Km0802}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0795}]}{\text{Km0795}}\right) - 1} \tag{299}$$

Table 600: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.051	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0802		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0795		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.150 Reaction r_0533

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name dUTP diphosphatase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0810} \xrightleftharpoons{\text{e\_1128, e\_0691, s\_0810, s\_0807, s\_0783}} \text{s\_0807} + \text{s\_0783} \tag{300}$$

Reactant

Table 601: Properties of each reactant.

Id	Name	SBO
s_0810	dUTP	

Modifiers

Table 602: Properties of each modifier.

Id	Name	SBO
e_1128	dut	0000460
e_0691	nudI	0000460
s_0810	dUTP	
s_0807	dUMP	
s_0783	Diphosphate	

Products

Table 603: Properties of each product.

Id	Name	SBO
s_0807	dUMP	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{150} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0810}] - \frac{[\text{s\_0807}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0810}}}{1 + \frac{[\text{s\_0810}]}{\text{Km0810}} + \left(1 + \frac{[\text{s\_0807}]}{\text{Km0807}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{301}$$

Table 604: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.036	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0810		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0807		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.151 Reaction r_0538

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name enolase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0675} \xrightleftharpoons{\mathrm{e\_0875,\ s\_0675,\ s\_1484}} \mathrm{s\_1484} \tag{302}$$

Reactant

Table 605: Properties of each reactant.

Id	Name	SBO
s_0675	D-Glycerate 2-phosphate	

Modifiers

Table 606: Properties of each modifier.

Id	Name	SBO
e_0875	eno	0000460
s_0675	D-Glycerate 2-phosphate	
s_1484	Phosphoenolpyruvate	

Product

Table 607: Properties of each product.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{151} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0675}] - \frac{[\text{s\_1484}]}{\text{Keq}} \right)}{\text{Km0675}}}{1 + \frac{[\text{s\_0675}]}{\text{Km0675}} + 1 + \frac{[\text{s\_1484}]}{\text{Km1484}} - 1} \tag{303}$$

Table 608: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.641	dimensionless	☑
Vmax		0000324	3.846	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0675		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1484		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.152 Reaction r_0563

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Enoylglutaryl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0812} + \text{s\_1336} \xrightleftharpoons{\text{e\_0436, s\_0812, s\_1336, s\_0910, s\_1335}} \text{s\_0910} + \text{s\_1335} \tag{304}$$

Reactants

Table 609: Properties of each reactant.

Id	Name	SBO
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 610: Properties of each modifier.

Id	Name	SBO
e_0436	fabI	0000460
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0910	Glutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 611: Properties of each product.

Id	Name	SBO
s_0910	Glutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{152} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0812}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_0910}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km0812} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0812}]}{\mathrm{Km0812}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_0910}]}{\mathrm{Km0910}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{305}$$

Table 612: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$3.87846855038663 \cdot 10^{-6}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0812		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0910		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.153 Reaction r_0564

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Enoylpimeloyl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0813} + \text{s\_1336} \xrightleftharpoons{\text{e\_0436, s\_0813, s\_1336, s\_1335, s\_1492}} \text{s\_1335} + \text{s\_1492} \tag{306}$$

Reactants

Table 613: Properties of each reactant.

Id	Name	SBO
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 614: Properties of each modifier.

Id	Name	SBO
e_0436	fabI	0000460
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	

Products

Table 615: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{153} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0813}] \cdot [\text{s\_1336}] - \frac{[\text{s\_1335}] \cdot [\text{s\_1492}]}{\text{Keq}} \right)}{\text{Km0813} \cdot \text{Km1336}}}{\left(1 + \frac{[\text{s\_0813}]}{\text{Km0813}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) + \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) \cdot \left(1 + \frac{[\text{s\_1492}]}{\text{Km1492}}\right) - 1} \tag{307}$$

Table 616: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$3.87846855038663 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0813		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1492		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.154 Reaction r_0573

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Erythronate 4-phosphate (4per) dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0331} + \text{s\_1333} \xrightleftharpoons{\text{e\_0731, s\_0331, s\_1333, s\_1334, s\_0231}} \text{s\_1334} + \text{s\_0231} \tag{308}$$

Reactants

Table 617: Properties of each reactant.

Id	Name	SBO
s_0331	4-Phospho-D-erythronate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 618: Properties of each modifier.

Id	Name	SBO
e_0731	pdxB	0000460

Id	Name	SBO
s_0331	4-Phospho-D-erythronate	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	

Products

Table 619: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{154} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0331}] \cdot [\mathrm{s\_1333}] - \frac{[\mathrm{s\_1334}] \cdot [\mathrm{s\_0231}]}{\mathrm{Keq}} \right)}{\mathrm{Km0331} \cdot \mathrm{Km1333}}}{\left(1 + \frac{[\mathrm{s\_0331}]}{\mathrm{Km0331}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) + \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0231}]}{\mathrm{Km0231}}\right) - 1} \tag{309}$$

Table 620: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244111493 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0331		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1333		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1334		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0231		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.155 Reaction r_0574

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name Erythrose 4-phosphate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0621} + \text{s\_1333} \xrightleftharpoons{\text{e\_0926, e\_0567, s\_0621, s\_1333, s\_0331, s\_1334}} \text{s\_0331} + \text{s\_1334} \tag{310}$$

Reactants

Table 621: Properties of each reactant.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 622: Properties of each modifier.

Id	Name	SBO
e_0926	epd	0000460
e_0567	gapA	0000460
s_0621	D-Erythrose 4-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_0331	4-Phospho-D-erythronate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 623: Properties of each product.

Id	Name	SBO
s_0331	4-Phospho-D-erythronate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{155} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0621}] \cdot [\text{s\_1333}] - \frac{[\text{s\_0331}] \cdot [\text{s\_1334}]}{\text{Keq}} \right)}{\text{Km0621} \cdot \text{Km1333}}}{\left(1 + \frac{[\text{s\_0621}]}{\text{Km0621}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) + \left(1 + \frac{[\text{s\_0331}]}{\text{Km0331}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) - 1} \tag{311}$$

Table 624: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244111493 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0621		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0331		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.156 Reaction r_0576

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name FAD reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0859} + \text{s\_1334} \xrightleftharpoons{\text{e\_1201, s\_0859, s\_1334, s\_0860, s\_1333}} \text{s\_0860} + \text{s\_1333} \qquad (312)$$

Reactants

Table 625: Properties of each reactant.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 626: Properties of each modifier.

Id	Name	SBO
e_1201	fre	0000460
s_0859	Flavin adenine dinucleotide oxidized	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0860	Flavin adenine dinucleotide reduced	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 627: Properties of each product.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{156} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0859}] \cdot [\text{s\_1334}] - \frac{[\text{s\_0860}] \cdot [\text{s\_1333}]}{\text{Keq}} \right)}{\text{Km0859} \cdot \text{Km1334}}}{\left(1 + \frac{[\text{s\_0859}]}{\text{Km0859}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) + \left(1 + \frac{[\text{s\_0860}]}{\text{Km0860}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) - 1} \tag{313}$$

Table 628: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.303	dimensionless	☑
Vmax		0000324	4.239	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0859		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0860		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.157 Reaction r_0579

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name fatty-acid-CoA thioesterase (dodecanoate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0790} \xrightleftharpoons{\text{e\_0162, s\_0790, s\_0555, s\_0785}} \text{s\_0555} + \text{s\_0785} \tag{314}$$

Reactant

Table 629: Properties of each reactant.

Id	Name	SBO
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	

Modifiers

Table 630: Properties of each modifier.

Id	Name	SBO
e_0162	tesB	0000460
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	
s_0555	Coenzyme A	
s_0785	Dodecanoate (n-C12:0)	

Products

Table 631: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_0785	Dodecanoate (n-C12:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{157} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0790}] - \frac{[\mathrm{s\_0555}] \cdot [\mathrm{s\_0785}]}{\mathrm{Keq}} \right)}{\mathrm{Km0790}}}{1 + \frac{[\mathrm{s\_0790}]}{\mathrm{Km0790}} + \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0785}]}{\mathrm{Km0785}}\right) - 1} \tag{315}$$

Table 632: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	☑
Vmax		0000324	0.108	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0790		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0555		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0785		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.158 Reaction r_0580

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name fatty-acid-CoA thioesterase (hexadecanoate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1412} \xrightleftharpoons{\text{e\_0162, s\_1412, s\_0555, s\_0971}} \text{s\_0555} + \text{s\_0971} \tag{316}$$

Reactant

Table 633: Properties of each reactant.

Id	Name	SBO
s_1412	Palmitoyl-CoA (n-C16:0CoA)	

Modifiers

Table 634: Properties of each modifier.

Id	Name	SBO
e_0162	tesB	0000460
s_1412	Palmitoyl-CoA (n-C16:0CoA)	
s_0555	Coenzyme A	
s_0971	Hexadecanoate (n-C16:0)	

Products

Table 635: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_0971	Hexadecanoate (n-C16:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{158} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1412}] - \frac{[\text{s\_0555}] \cdot [\text{s\_0971}]}{\text{Keq}} \right)}{\text{Km1412}}}{1 + \frac{[\text{s\_1412}]}{\text{Km1412}} + \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) \cdot \left(1 + \frac{[\text{s\_0971}]}{\text{Km0971}}\right) - 1} \tag{317}$$

Table 636: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.018	dimensionless	☑
Vmax		0000324	0.177	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1412		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0971		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.159 Reaction r_0581

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name fatty-acid-CoA thioesterase (hexadecenoate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0979} \xrightleftharpoons{\text{e\_0162, s\_0979, s\_0555, s\_0976}} \text{s\_0555} + \text{s\_0976} \tag{318}$$

Reactant

Table 637: Properties of each reactant.

Id	Name	SBO
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	

Modifiers

Table 638: Properties of each modifier.

Id	Name	SBO
e_0162	tesB	0000460
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	
s_0555	Coenzyme A	

Id	Name	SBO
s_0976	Hexadecenoate (n-C16:1)	

Products

Table 639: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_0976	Hexadecenoate (n-C16:1)	

Kinetic Law

Derived unit contains undeclared units

$$v_{159} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0979}] - \frac{[\mathrm{s\_0555}] \cdot [\mathrm{s\_0976}]}{\mathrm{Keq}} \right)}{\mathrm{Km0979}}}{1 + \frac{[\mathrm{s\_0979}]}{\mathrm{Km0979}} + \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0976}]}{\mathrm{Km0976}}\right) - 1} \tag{319}$$

Table 640: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑
Vmax		0000324	0.208	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0979		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0555		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0976		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.160 Reaction r_0602

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name Ferrochelatase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0838} + \mathrm{s\_1511} \xrightleftharpoons{\mathrm{e\_0168,\ s\_0838,\ s\_1511,\ s\_1508}} \mathrm{s\_1508} \tag{320}$$

Reactants

Table 641: Properties of each reactant.

Id	Name	SBO
s_0838	Fe2+	
s_1511	Protoporphyrin	

Modifiers

Table 642: Properties of each modifier.

Id	Name	SBO
e_0168	hemH	0000460
s_0838	Fe2+	
s_1511	Protoporphyrin	
s_1508	Protoheme	

Product

Table 643: Properties of each product.

Id	Name	SBO
s_1508	Protoheme	

Kinetic Law

Derived unit contains undeclared units

$$v_{160} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0838}] \cdot [\text{s\_1511}] - \frac{[\text{s\_1508}]}{\text{Keq}} \right)}{\text{Km0838} \cdot \text{Km1511}}}{\left(1 + \frac{[\text{s\_0838}]}{\text{Km0838}}\right) \cdot \left(1 + \frac{[\text{s\_1511}]}{\text{Km1511}}\right) + 1 + \frac{[\text{s\_1508}]}{\text{Km1508}} - 1} \tag{321}$$

Table 644: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317225085 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.08892317225085 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km0838		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1511		0000322	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑
Km1508		0000323	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑

6.161 Reaction r_0611

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name FMN adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0863} \xrightleftharpoons{\mathrm{e\_0008,\ s\_0467,\ s\_0863,\ s\_0859,\ s\_0783}} \mathrm{s\_0859} + \mathrm{s\_0783} \qquad (322)$$

Reactants

Table 645: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0863	FMN	

Modifiers

Table 646: Properties of each modifier.

Id	Name	SBO
e_0008	ribF	0000460
s_0467	ATP	
s_0863	FMN	
s_0859	Flavin adenine dinucleotide oxidized	
s_0783	Diphosphate	

Products

Table 647: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	

Id	Name	SBO
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{161} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0863}] - \frac{[\text{s\_0859}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0863}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0863}]}{\text{Km0863}}\right) + \left(1 + \frac{[\text{s\_0859}]}{\text{Km0859}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{323}$$

Table 648: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229329 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244121061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0863		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.162 Reaction r_0622

This is a reversible reaction of three reactants forming three products influenced by six modifiers.

Name formate-tetrahydrofolate ligase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0867} + \text{s\_0337} \xrightleftharpoons{\text{s\_0467, s\_0867, s\_0337, s\_0133, s\_0421, s\_1430}} \text{s\_0133} + \text{s\_0421} + \text{s\_1430} \tag{324}$$

Reactants

Table 649: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	

Id	Name	SBO
s_0867	Formate	
s_0337	5,6,7,8-Tetrahydrofolate	

Modifiers

Table 650: Properties of each modifier.

Id	Name	SBO
s_0467	ATP	
s_0867	Formate	
s_0337	5,6,7,8-Tetrahydrofolate	
s_0133	10-Formyltetrahydrofolate	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 651: Properties of each product.

Id	Name	SBO
s_0133	10-Formyltetrahydrofolate	
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{162} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0867}] \cdot [\mathrm{s\_0337}] - \frac{[\mathrm{s\_0133}] \cdot [\mathrm{s\_0421}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0867} \cdot \mathrm{Km0337}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0867}]}{\mathrm{Km0867}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0337}]}{\mathrm{Km0337}}\right) + \left(1 + \frac{[\mathrm{s\_0133}]}{\mathrm{Km0133}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{325}$$

Table 652: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.036	dimensionless	☑
Vmax		0000324	1.087	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0867		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0337		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0133		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.163 Reaction r_0632

This is a reversible reaction of one reactant forming one product influenced by five modifiers.

Name fumarase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0875} \xrightleftharpoons{\mathrm{e\_1298},\ \mathrm{e\_0515},\ \mathrm{e\_0516},\ \mathrm{s\_0875},\ \mathrm{s\_1138}} \mathrm{s\_1138} \tag{326}$$

Reactant

Table 653: Properties of each reactant.

Id	Name	SBO
s_0875	Fumarate	

Modifiers

Table 654: Properties of each modifier.

Id	Name	SBO
e_1298	fumB	0000460
e_0515	fumC	0000460
e_0516	fumA	0000460
s_0875	Fumarate	
s_1138	L-Malate	

Product

Table 655: Properties of each product.

Id	Name	SBO
s_1138	L-Malate	

Kinetic Law

Derived unit contains undeclared units

$$v_{163} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0875}] - \frac{[\text{s\_1138}]}{\text{Keq}} \right)}{\text{Km0875}}}{1 + \frac{[\text{s\_0875}]}{\text{Km0875}} + 1 + \frac{[\text{s\_1138}]}{\text{Km1138}} - 1} \tag{327}$$

Table 656: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.143	dimensionless	☑
Vmax		0000324	0.859	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0875		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1138		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.164 Reaction r_0648

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name GAR transformylase-T

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0867} + \text{s\_1318} \xrightleftharpoons{\text{e\_0577, s\_0467, s\_0867, s\_1318, s\_0421, s\_1322, s\_1430}} \text{s\_0421} + \text{s\_1322} + \text{s\_1430} \tag{328}$$

Reactants

Table 657: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	

Id	Name	SBO
s_0867	Formate	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	

Modifiers

Table 658: Properties of each modifier.

Id	Name	SBO
e_0577	purT	0000460
s_0467	ATP	
s_0867	Formate	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	
s_0421	ADP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Products

Table 659: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{164} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0867}] \cdot [\mathrm{s\_1318}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_1322}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0867} \cdot \mathrm{Km1318}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0867}]}{\mathrm{Km0867}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1318}]}{\mathrm{Km1318}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1322}]}{\mathrm{Km1322}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{329}$$

Table 660: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	1.843	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0867		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1318		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1322		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.165 Reaction r_0655

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name geranyltranstransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0903} + \mathrm{s\_1028} \xrightleftharpoons{\mathrm{e\_0150},\ \mathrm{s\_0903},\ \mathrm{s\_1028},\ \mathrm{s\_0826},\ \mathrm{s\_0783}} \mathrm{s\_0826} + \mathrm{s\_0783} \tag{330}$$

Reactants

Table 661: Properties of each reactant.

Id	Name	SBO
s_0903	Geranyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 662: Properties of each modifier.

Id	Name	SBO
e_0150	ispA	0000460
s_0903	Geranyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0826	Farnesyl diphosphate	
s_0783	Diphosphate	

Products

Table 663: Properties of each product.

Id	Name	SBO
s_0826	Farnesyl diphosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{165} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0903}] \cdot [\text{s\_1028}] - \frac{[\text{s\_0826}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0903} \cdot \text{Km1028}}}{\left(1 + \frac{[\text{s\_0903}]}{\text{Km0903}}\right) \cdot \left(1 + \frac{[\text{s\_1028}]}{\text{Km1028}}\right) + \left(1 + \frac{[\text{s\_0826}]}{\text{Km0826}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{331}$$

Table 664: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.85076521030325 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$5.39107129442455 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0903		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1028		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0826		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.166 Reaction r_0658

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glucosamine-1-phosphate N-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0395} + \text{s\_0653} \xrightleftharpoons{\text{e\_1150, s\_0395, s\_0653, s\_1287, s\_0555}} \text{s\_1287} + \text{s\_0555} \tag{332}$$

Reactants

Table 665: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0653	D-Glucosamine 1-phosphate	

Modifiers

Table 666: Properties of each modifier.

Id	Name	SBO
e_1150	glmU	0000460
s_0395	Acetyl-CoA	
s_0653	D-Glucosamine 1-phosphate	
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_0555	Coenzyme A	

Products

Table 667: Properties of each product.

Id	Name	SBO
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{166} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0395}] \cdot [\mathrm{s\_0653}] - \frac{[\mathrm{s\_1287}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0395} \cdot \mathrm{Km0653}}}{\left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0653}]}{\mathrm{Km0653}}\right) + \left(1 + \frac{[\mathrm{s\_1287}]}{\mathrm{Km1287}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{333}$$

Table 668: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.183	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0653		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1287		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0555		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.167 Reaction r_0660

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glucose 6-phosphate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0663} + \mathrm{s\_1335} \xrightleftharpoons{\mathrm{e\_0580},\ \mathrm{s\_0663},\ \mathrm{s\_1335},\ \mathrm{s\_0370},\ \mathrm{s\_1336}} \mathrm{s\_0370} + \mathrm{s\_1336} \tag{334}$$

Reactants

Table 669: Properties of each reactant.

Id	Name	SBO
s_0663	D-Glucose 6-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 670: Properties of each modifier.

Id	Name	SBO
e_0580	zwf	0000460
s_0663	D-Glucose 6-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0370	6-phospho-D-glucono-1,5-lactone	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 671: Properties of each product.

Id	Name	SBO
s_0370	6-phospho-D-glucono-1,5-lactone	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{167} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0663}] \cdot [\text{s\_1335}] - \frac{[\text{s\_0370}] \cdot [\text{s\_1336}]}{\text{Keq}} \right)}{\text{Km0663} \cdot \text{Km1335}}}{\left(1 + \frac{[\text{s\_0663}]}{\text{Km0663}}\right) \cdot \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) + \left(1 + \frac{[\text{s\_0370}]}{\text{Km0370}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) - 1} \tag{335}$$

Table 672: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	☑
Vmax		0000324	12.318	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0663		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0370		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.168 Reaction r_0664

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name glucose-6-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0663} \xrightleftharpoons{\text{e\_1264, s\_0663, s\_0627}} \text{s\_0627} \tag{336}$$

Reactant

Table 673: Properties of each reactant.

Id	Name	SBO
s_0663	D-Glucose 6-phosphate	

Modifiers

Table 674: Properties of each modifier.

Id	Name	SBO
e_1264	pgi	0000460
s_0663	D-Glucose 6-phosphate	
s_0627	D-Fructose 6-phosphate	

Product

Table 675: Properties of each product.

Id	Name	SBO
s_0627	D-Fructose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{168} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0663}] - \frac{[\mathrm{s\_0627}]}{\mathrm{Keq}} \right)}{\mathrm{Km0663}}}{1 + \frac{[\mathrm{s\_0663}]}{\mathrm{Km0663}} + 1 + \frac{[\mathrm{s\_0627}]}{\mathrm{Km0627}} - 1} \tag{337}$$

Table 676: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.055	dimensionless	☑
Vmax		0000324	0.327	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0663		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0627		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.169 Reaction r_0673

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glutamate 5-kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1095} \xrightleftharpoons{\text{e\_0099, s\_0467, s\_1095, s\_0421, s\_1099}} \text{s\_0421} + \text{s\_1099} \tag{338}$$

Reactants

Table 677: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1095	L-Glutamate	

Modifiers

Table 678: Properties of each modifier.

Id	Name	SBO
e_0099	proB	0000460
s_0467	ATP	
s_1095	L-Glutamate	
s_0421	ADP	
s_1099	L-Glutamate 5-phosphate	

Products

Table 679: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1099	L-Glutamate 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{169} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1095}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1099}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1095}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1099}]}{\text{Km1099}}\right) - 1} \tag{339}$$

Table 680: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	☑
Vmax		0000324	0.429	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1099		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.170 Reaction r_0675

This is a reversible reaction of three reactants forming two products influenced by six modifiers.

Name glutamate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0233} + \text{s\_1336} + \text{s\_0451} \xrightleftharpoons{\text{e\_0561, s\_0233, s\_1336, s\_0451, s\_1095, s\_1335}} \text{s\_1095} + \text{s\_1335} \tag{340}$$

Reactants

Table 681: Properties of each reactant.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0451	Ammonium	

Modifiers

Table 682: Properties of each modifier.

Id	Name	SBO
e_0561	gdhA	0000460
s_0233	2-Oxoglutarate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0451	Ammonium	
s_1095	L-Glutamate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 683: Properties of each product.

Id	Name	SBO
s_1095	L-Glutamate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{170} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0233}] \cdot [\mathrm{s\_1336}] \cdot [\mathrm{s\_0451}] - \frac{[\mathrm{s\_1095}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km0233} \cdot \mathrm{Km1336} \cdot \mathrm{Km0451}}}{\left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0451}]}{\mathrm{Km0451}}\right) + \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{341}$$

Table 684: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.175	dimensionless	☑
Vmax		0000324	25.851	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	20.000	$\mathrm{mmol^{-1} \cdot l}$	☑
Km0233		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0451		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1095		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.171 Reaction r_0676

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name glutamate racemase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1095} \xrightleftharpoons{\text{e\_1247, s\_1095, s\_0671}} \text{s\_0671} \tag{342}$$

Reactant

Table 685: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	

Modifiers

Table 686: Properties of each modifier.

Id	Name	SBO
e_1247	murI	0000460
s_1095	L-Glutamate	
s_0671	D-Glutamate	

Product

Table 687: Properties of each product.

Id	Name	SBO
s_0671	D-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{171} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1095}] - \frac{[\text{s\_0671}]}{\text{Keq}} \right)}{\text{Km1095}}}{1 + \frac{[\text{s\_1095}]}{\text{Km1095}} + 1 + \frac{[\text{s\_0671}]}{\text{Km0671}} - 1} \tag{343}$$

Table 688: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.023	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1095		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0671		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.172 Reaction r_0678

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name glutamate-1-semialdehyde aminotransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1098} \xrightleftharpoons{\mathrm{e\_0071,\ s\_1098,\ s\_0345}} \mathrm{s\_0345} \tag{344}$$

Reactant

Table 689: Properties of each reactant.

Id	Name	SBO
s_1098	L-Glutamate 1-semialdehyde	

Modifiers

Table 690: Properties of each modifier.

Id	Name	SBO
e_0071	hemL	0000460
s_1098	L-Glutamate 1-semialdehyde	
s_0345	5-Amino-4-oxopentanoate	

Product

Table 691: Properties of each product.

Id	Name	SBO
s_0345	5-Amino-4-oxopentanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{172} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1098}] - \frac{[\text{s\_0345}]}{\text{Keq}} \right)}{\text{Km1098}}}{1 + \frac{[\text{s\_1098}]}{\text{Km1098}} + 1 + \frac{[\text{s\_0345}]}{\text{Km0345}} - 1} \tag{345}$$

Table 692: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.94227707563336 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1098		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0345		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.173 Reaction r_0679

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name glutamate-5-semialdehyde dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1099} + \text{s\_1336} \xrightleftharpoons{\text{e\_0100, s\_1099, s\_1336, s\_1100, s\_1335, s\_1430}} \text{s\_1100} + \text{s\_1335} + \text{s\_1430} \tag{346}$$

Reactants

Table 693: Properties of each reactant.

Id	Name	SBO
s_1099	L-Glutamate 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 694: Properties of each modifier.

Id	Name	SBO
e_0100	proA	0000460
s_1099	L-Glutamate 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1100	L-Glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Products

Table 695: Properties of each product.

Id	Name	SBO
s_1100	L-Glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{173} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1099}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_1100}] \cdot [\mathrm{s\_1335}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km1099} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_1099}]}{\mathrm{Km1099}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_1100}]}{\mathrm{Km1100}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{347}$$

Table 696: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	☑
Vmax		0000324	0.674	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1099		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1100		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.174 Reaction r_0682

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name glutamine phosphoribosyldiphosphate amidotransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1101} + \text{s\_0360} \xrightleftharpoons{\text{e\_0728, s\_1101, s\_0360, s\_1095, s\_0783, s\_0361}} \text{s\_1095} + \text{s\_0783} + \text{s\_0361} \tag{348}$$

Reactants

Table 697: Properties of each reactant.

Id	Name	SBO
s_1101	L-Glutamine	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 698: Properties of each modifier.

Id	Name	SBO
e_0728	purF	0000460
s_1101	L-Glutamine	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_1095	L-Glutamate	
s_0783	Diphosphate	
s_0361	5-Phospho-beta-D-ribosylamine	

Products

Table 699: Properties of each product.

Id	Name	SBO
s_1095	L-Glutamate	
s_0783	Diphosphate	
s_0361	5-Phospho-beta-D-ribosylamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{174} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1101}] \cdot [\text{s\_0360}] - \frac{[\text{s\_1095}] \cdot [\text{s\_0783}] \cdot [\text{s\_0361}]}{\text{Keq}} \right)}{\text{Km1101} \cdot \text{Km0360}}}{\left(1 + \frac{[\text{s\_1101}]}{\text{Km1101}}\right) \cdot \left(1 + \frac{[\text{s\_0360}]}{\text{Km0360}}\right) + \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) \cdot \left(1 + \frac{[\text{s\_0361}]}{\text{Km0361}}\right) - 1} \tag{349}$$

Table 700: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	1.351	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0360		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1095		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0361		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.175 Reaction r_0683

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name glutamine synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1095} + \text{s\_0451} \xrightleftharpoons{\text{e\_1210, e\_0439, s\_0467, s\_1095, s\_0451, s\_0421, s\_1101, s\_1430}} \text{s\_0421} + \text{s\_1101} + \text{s\_143} \tag{350}$$

Reactants

Table 701: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1095	L-Glutamate	

Id	Name	SBO
s_0451	Ammonium	

Modifiers

Table 702: Properties of each modifier.

Id	Name	SBO
e_1210	glnA	0000460
e_0439	puuA	0000460
s_0467	ATP	
s_1095	L-Glutamate	
s_0451	Ammonium	
s_0421	ADP	
s_1101	L-Glutamine	
s_1430	Phosphate	

Products

Table 703: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1101	L-Glutamine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{175} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1095}] \cdot [\mathrm{s\_0451}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_1101}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1095} \cdot \mathrm{Km0451}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0451}]}{\mathrm{Km0451}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1101}]}{\mathrm{Km1101}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{351}$$

Table 704: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.249	dimensionless	☑
Vmax		0000324	7.484	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1095		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0451		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1101		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.176 Reaction r_0684

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glutamine-fructose-6-phosphate transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0627} + \mathrm{s\_1101} \xrightleftharpoons{\mathrm{e\_1149},\ \mathrm{s\_0627},\ \mathrm{s\_1101},\ \mathrm{s\_0654},\ \mathrm{s\_1095}} \mathrm{s\_0654} + \mathrm{s\_1095} \tag{352}$$

Reactants

Table 705: Properties of each reactant.

Id	Name	SBO
s_0627	D-Fructose 6-phosphate	
s_1101	L-Glutamine	

Modifiers

Table 706: Properties of each modifier.

Id	Name	SBO
e_1149	glmS	0000460
s_0627	D-Fructose 6-phosphate	
s_1101	L-Glutamine	
s_0654	D-Glucosamine 6-phosphate	
s_1095	L-Glutamate	

Products

Table 707: Properties of each product.

Id	Name	SBO
s_0654	D-Glucosamine 6-phosphate	
s_1095	L-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{176} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0627}] \cdot [\text{s\_1101}] - \frac{[\text{s\_0654}] \cdot [\text{s\_1095}]}{\text{Keq}} \right)}{\text{Km0627} \cdot \text{Km1101}}}{\left(1 + \frac{[\text{s\_0627}]}{\text{Km0627}}\right) \cdot \left(1 + \frac{[\text{s\_1101}]}{\text{Km1101}}\right) + \left(1 + \frac{[\text{s\_0654}]}{\text{Km0654}}\right) \cdot \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) - 1} \tag{353}$$

Table 708: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.183	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0627		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0654		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1095		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.177 Reaction r_0686

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name glutamyl-tRNA reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1105} + \text{s\_1336} \xrightleftharpoons{\text{e\_0405, s\_1105, s\_1336, s\_1098, s\_1335, s\_1690}} \text{s\_1098} + \text{s\_1335} + \text{s\_1690} \tag{354}$$

Reactants

Table 709: Properties of each reactant.

Id	Name	SBO
s_1105	L-Glutamyl-tRNA(Glu)	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 710: Properties of each modifier.

Id	Name	SBO
e_0405	hemA	0000460
s_1105	L-Glutamyl-tRNA(Glu)	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1098	L-Glutamate 1-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1690	tRNA (Glu)	

Products

Table 711: Properties of each product.

Id	Name	SBO
s_1098	L-Glutamate 1-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1690	tRNA (Glu)	

Kinetic Law

Derived unit contains undeclared units

$$v_{177} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1105}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_1098}] \cdot [\mathrm{s\_1335}] \cdot [\mathrm{s\_1690}]}{\mathrm{Keq}} \right)}{\mathrm{Km1105} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_1105}]}{\mathrm{Km1105}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_1098}]}{\mathrm{Km1098}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1690}]}{\mathrm{Km1690}}\right) - 1} \tag{355}$$

Table 712: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.94227707563336 \cdot 10^{-4}$	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.011	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1105		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1098		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1690		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.178 Reaction r_0687

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name Glutamyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_1095} + \mathrm{s\_1690} \xrightleftharpoons{\text{e\_0746, s\_0467, s\_1095, s\_1690, s\_0454, s\_1105, s\_0783}} \mathrm{s\_0454} + \mathrm{s\_1105} + \mathrm{s\_0783} \quad (356)$$

Reactants

Table 713: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1095	L-Glutamate	
s_1690	tRNA (Glu)	

Modifiers

Table 714: Properties of each modifier.

Id	Name	SBO
e_0746	gltX	0000460
s_0467	ATP	
s_1095	L-Glutamate	
s_1690	tRNA (Glu)	
s_0454	AMP	

Id	Name	SBO
s_1105	L-Glutamyl-tRNA(Glu)	
s_0783	Diphosphate	

Products

Table 715: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1105	L-Glutamyl-tRNA(Glu)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{178} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1095}] \cdot [\mathrm{s\_1690}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_1105}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1095} \cdot \mathrm{Km1690}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1690}]}{\mathrm{Km1690}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1105}]}{\mathrm{Km1105}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{357}$$

Table 716: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.94227707563336 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.015	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1095		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1690		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0454		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1105		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.179 Reaction r_0695

This is a reversible reaction of three reactants forming two products influenced by six modifiers.

Name glyceraldehyde-3-phosphate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0913} + \mathrm{s\_1333} + \mathrm{s\_1430} \xrightleftharpoons{\mathrm{e\_0567},\ \mathrm{s\_0913},\ \mathrm{s\_1333},\ \mathrm{s\_1430},\ \mathrm{s\_0307},\ \mathrm{s\_1334}} \mathrm{s\_0307} + \mathrm{s\_1334} \tag{358}$$

Reactants

Table 717: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_1430	Phosphate	

Modifiers

Table 718: Properties of each modifier.

Id	Name	SBO
e_0567	gapA	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_1430	Phosphate	
s_0307	3-Phospho-D-glyceroyl phosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 719: Properties of each product.

Id	Name	SBO
s_0307	3-Phospho-D-glyceroyl phosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{179} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0913}] \cdot [\text{s\_1333}] \cdot [\text{s\_1430}] - \frac{[\text{s\_0307}] \cdot [\text{s\_1334}]}{\text{Keq}} \right)}{\text{Km0913} \cdot \text{Km1333} \cdot \text{Km1430}}}{\left(1 + \frac{[\text{s\_0913}]}{\text{Km0913}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) + \left(1 + \frac{[\text{s\_0307}]}{\text{Km0307}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) - 1} \tag{359}$$

Table 720: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.788	dimensionless	☑
Vmax		0000324	17.332	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km0913		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0307		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.180 Reaction r_0697

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycerate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0029} \xrightleftharpoons{\text{e\_0978, s\_0467, s\_0029, s\_0675, s\_0421}} \text{s\_0675} + \text{s\_0421} \tag{360}$$

Reactants

Table 721: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0029	(R)-Glycerate	

Modifiers

Table 722: Properties of each modifier.

Id	Name	SBO
e_0978	garK	0000460
s_0467	ATP	
s_0029	(R)-Glycerate	
s_0675	D-Glycerate 2-phosphate	
s_0421	ADP	

Products

Table 723: Properties of each product.

Id	Name	SBO
s_0675	D-Glycerate 2-phosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{180} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0029}] - \frac{[\mathrm{s\_0675}] \cdot [\mathrm{s\_0421}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0029}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0029}]}{\mathrm{Km0029}}\right) + \left(1 + \frac{[\mathrm{s\_0675}]}{\mathrm{Km0675}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) - 1} \tag{361}$$

Table 724: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338475844011 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.48673866181615 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0029		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0675		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.181 Reaction r_0706

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name glycerol-3-phosphate acyltransferase (C16:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0920} + \mathrm{s\_1411} \xrightleftharpoons{\mathrm{e\_0375},\ \mathrm{e\_1273},\ \mathrm{s\_0920},\ \mathrm{s\_1411},\ \mathrm{s\_0121},\ \mathrm{s\_0397}} \mathrm{s\_0121} + \mathrm{s\_0397} \tag{362}$$

Reactants

Table 725: Properties of each reactant.

Id	Name	SBO
s_0920	Glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	

Modifiers

Table 726: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_1273	plsB	0000460
s_0920	Glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Products

Table 727: Properties of each product.

Id	Name	SBO
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{181} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0920}] \cdot [\mathrm{s\_1411}] - \frac{[\mathrm{s\_0121}] \cdot [\mathrm{s\_0397}]}{\mathrm{Keq}} \right)}{\mathrm{Km0920} \cdot \mathrm{Km1411}}}{\left(1 + \frac{[\mathrm{s\_0920}]}{\mathrm{Km0920}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1411}]}{\mathrm{Km1411}}\right) + \left(1 + \frac{[\mathrm{s\_0121}]}{\mathrm{Km0121}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) - 1} \tag{363}$$

Table 728: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	☑
Vmax		0000324	0.124	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0920		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1411		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0121		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0397		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.182 Reaction r_0707

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name glycerol-3-phosphate acyltransferase (C16:1)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0920} + \mathrm{s\_0533} \xrightleftharpoons{\mathrm{e\_0375,\ e\_1273,\ s\_0920,\ s\_0533,\ s\_0119,\ s\_0397}} \mathrm{s\_0119} + \mathrm{s\_0397} \qquad (364)$$

Reactants

Table 729: Properties of each reactant.

Id	Name	SBO
s_0920	Glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	

Modifiers

Table 730: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_1273	plsB	0000460
s_0920	Glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Products

Table 731: Properties of each product.

Id	Name	SBO
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{182} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0920}] \cdot [\mathrm{s\_0533}] - \frac{[\mathrm{s\_0119}] \cdot [\mathrm{s\_0397}]}{\mathrm{Keq}} \right)}{\mathrm{Km0920} \cdot \mathrm{Km0533}}}{\left(1 + \frac{[\mathrm{s\_0920}]}{\mathrm{Km0920}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0533}]}{\mathrm{Km0533}}\right) + \left(1 + \frac{[\mathrm{s\_0119}]}{\mathrm{Km0119}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) - 1} \tag{365}$$

Table 732: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	☑
Vmax		0000324	0.146	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0920		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0533		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0119		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0397		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.183 Reaction r_0712

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycerol-3-phosphate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0772} + \mathrm{s\_1336} \xrightleftharpoons{\mathrm{e\_1106,\ s\_0772,\ s\_1336,\ s\_0920,\ s\_1335}} \mathrm{s\_0920} + \mathrm{s\_1335} \tag{366}$$

Reactants

Table 733: Properties of each reactant.

Id	Name	SBO
s_0772	Dihydroxyacetone phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 734: Properties of each modifier.

Id	Name	SBO
e_1106	gpsA	0000460
s_0772	Dihydroxyacetone phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0920	Glycerol 3-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 735: Properties of each product.

Id	Name	SBO
s_0920	Glycerol 3-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{183} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0772}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_0920}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km0772} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0772}]}{\mathrm{Km0772}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_0920}]}{\mathrm{Km0920}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{367}$$

Table 736: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.019	dimensionless	☑
Vmax		0000324	0.270	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0772		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0920		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.184 Reaction r_0724

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycine C-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1040} + \mathrm{s\_0555} \xrightleftharpoons{\mathrm{e\_1110},\ \mathrm{s\_1040},\ \mathrm{s\_0555},\ \mathrm{s\_0395},\ \mathrm{s\_0929}} \mathrm{s\_0395} + \mathrm{s\_0929} \tag{368}$$

Reactants

Table 737: Properties of each reactant.

Id	Name	SBO
s_1040	L-2-Amino-3-oxobutanoate	
s_0555	Coenzyme A	

Modifiers

Table 738: Properties of each modifier.

Id	Name	SBO
e_1110	kbl	0000460
s_1040	L-2-Amino-3-oxobutanoate	
s_0555	Coenzyme A	
s_0395	Acetyl-CoA	
s_0929	Glycine	

Products

Table 739: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0929	Glycine	

Kinetic Law

Derived unit contains undeclared units

$$v_{184} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1040}] \cdot [\text{s\_0555}] - \frac{[\text{s\_0395}] \cdot [\text{s\_0929}]}{\text{Keq}} \right)}{\text{Km1040} \cdot \text{Km0555}}}{\left(1 + \frac{[\text{s\_1040}]}{\text{Km1040}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) + \left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_0929}]}{\text{Km0929}}\right) - 1} \tag{369}$$

Table 740: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.580	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1040		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0395		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0929		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.185 Reaction r_0726

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycine hydroxymethyltransferase, reversible

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1170} + \text{s\_0337} \xrightleftharpoons{\text{e\_0813, s\_1170, s\_0337, s\_0929, s\_0336}} \text{s\_0929} + \text{s\_0336} \tag{370}$$

Reactants

Table 741: Properties of each reactant.

Id	Name	SBO
s_1170	L-Serine	
s_0337	5,6,7,8-Tetrahydrofolate	

Modifiers

Table 742: Properties of each modifier.

Id	Name	SBO
e_0813	glyA	0000460
s_1170	L-Serine	
s_0337	5,6,7,8-Tetrahydrofolate	
s_0929	Glycine	
s_0336	5,10-Methylenetetrahydrofolate	

Products

Table 743: Properties of each product.

Id	Name	SBO
s_0929	Glycine	
s_0336	5,10-Methylenetetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{185} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1170}] \cdot [\mathrm{s\_0337}] - \frac{[\mathrm{s\_0929}] \cdot [\mathrm{s\_0336}]}{\mathrm{Keq}} \right)}{\mathrm{Km1170} \cdot \mathrm{Km0337}}}{\left(1 + \frac{[\mathrm{s\_1170}]}{\mathrm{Km1170}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0337}]}{\mathrm{Km0337}}\right) + \left(1 + \frac{[\mathrm{s\_0929}]}{\mathrm{Km0929}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0336}]}{\mathrm{Km0336}}\right) - 1} \tag{371}$$

Table 744: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.063	dimensionless	☑
Vmax		0000324	0.888	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1170		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0337		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0929		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0336		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.186 Reaction r_0731

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Glycolaldehyde dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0936} + \mathrm{s\_1333} \xrightleftharpoons{\mathrm{e\_0466},\ \mathrm{s\_0936},\ \mathrm{s\_1333},\ \mathrm{s\_0937},\ \mathrm{s\_1334}} \mathrm{s\_0937} + \mathrm{s\_1334} \tag{372}$$

Reactants

Table 745: Properties of each reactant.

Id	Name	SBO
s_0936	Glycolaldehyde	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 746: Properties of each modifier.

Id	Name	SBO
e_0466	aldA	0000460
s_0936	Glycolaldehyde	
s_1333	Nicotinamide adenine dinucleotide	
s_0937	Glycolate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 747: Properties of each product.

Id	Name	SBO
s_0937	Glycolate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{186} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0936}] \cdot [\text{s\_1333}] - \frac{[\text{s\_0937}] \cdot [\text{s\_1334}]}{\text{Keq}} \right)}{\text{Km0936} \cdot \text{Km1333}}}{\left(1 + \frac{[\text{s\_0936}]}{\text{Km0936}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) + \left(1 + \frac{[\text{s\_0937}]}{\text{Km0937}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) - 1} \tag{373}$$

Table 748: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0936		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0937		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.187 Reaction r_0734

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name Glycolate oxidase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0937} + \text{s\_1732} \xrightleftharpoons{\text{e\_1376, e\_0941, e\_1377, s\_0937, s\_1732, s\_0941, s\_1731}} \text{s\_0941} + \text{s\_1731} \tag{374}$$

Reactants

Table 749: Properties of each reactant.

Id	Name	SBO
s_0937	Glycolate	
s_1732	Ubiquinone-8	

Modifiers

Table 750: Properties of each modifier.

Id	Name	SBO
e_1376	glcF	0000460
e_0941	glcD	0000460
e_1377	glcE	0000460
s_0937	Glycolate	
s_1732	Ubiquinone-8	
s_0941	Glyoxylate	
s_1731	Ubiquinol-8	

Products

Table 751: Properties of each product.

Id	Name	SBO
s_0941	Glyoxylate	
s_1731	Ubiquinol-8	

Kinetic Law

Derived unit contains undeclared units

$$v_{187} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0937}] \cdot [\mathrm{s\_1732}] - \frac{[\mathrm{s\_0941}] \cdot [\mathrm{s\_1731}]}{\mathrm{Keq}} \right)}{\mathrm{Km0937} \cdot \mathrm{Km1732}}}{\left(1 + \frac{[\mathrm{s\_0937}]}{\mathrm{Km0937}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1732}]}{\mathrm{Km1732}}\right) + \left(1 + \frac{[\mathrm{s\_0941}]}{\mathrm{Km0941}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1731}]}{\mathrm{Km1731}}\right) - 1} \tag{375}$$

Table 752: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338477495988 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.48673868494383 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0937		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1732		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0941		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1731		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.188 Reaction r_0735

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name Glycolate oxidase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0937} + \mathrm{s\_1240} \xrightleftharpoons{\mathrm{e\_1376},\ \mathrm{e\_0941},\ \mathrm{e\_1377},\ \mathrm{s\_0937},\ \mathrm{s\_1240},\ \mathrm{s\_0941},\ \mathrm{s\_1239}} \mathrm{s\_0941} + \mathrm{s\_1239} \tag{376}$$

Reactants

Table 753: Properties of each reactant.

Id	Name	SBO
s_0937	Glycolate	
s_1240	Menaquinone 8	

Modifiers

Table 754: Properties of each modifier.

Id	Name	SBO
e_1376	glcF	0000460
e_0941	glcD	0000460
e_1377	glcE	0000460
s_0937	Glycolate	
s_1240	Menaquinone 8	
s_0941	Glyoxylate	
s_1239	Menaquinol 8	

Products

Table 755: Properties of each product.

Id	Name	SBO
s_0941	Glyoxylate	
s_1239	Menaquinol 8	

Kinetic Law

Derived unit contains undeclared units

$$v_{188} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0937}] \cdot [\text{s\_1240}] - \frac{[\text{s\_0941}] \cdot [\text{s\_1239}]}{\text{Keq}} \right)}{\text{Km0937} \cdot \text{Km1240}}}{\left(1 + \frac{[\text{s\_0937}]}{\text{Km0937}}\right) \cdot \left(1 + \frac{[\text{s\_1240}]}{\text{Km1240}}\right) + \left(1 + \frac{[\text{s\_0941}]}{\text{Km0941}}\right) \cdot \left(1 + \frac{[\text{s\_1239}]}{\text{Km1239}}\right) - 1} \tag{377}$$

Table 756: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338474145563 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.48673863803788 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0937		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1240		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0941		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1239		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.189 Reaction r_0739

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name glyoxalate carboligase

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\text{s\_0941} \xrightleftharpoons{\text{e\_0175, s\_0941, s\_0214, s\_0543}} \text{s\_0214} + \text{s\_0543} \tag{378}$$

Reactant

Table 757: Properties of each reactant.

Id	Name	SBO
s_0941	Glyoxylate	

Modifiers

Table 758: Properties of each modifier.

Id	Name	SBO
e_0175	gcl	0000460
s_0941	Glyoxylate	
s_0214	2-Hydroxy-3-oxopropanoate	
s_0543	CO2	

Products

Table 759: Properties of each product.

Id	Name	SBO
s_0214	2-Hydroxy-3-oxopropanoate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{189} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0941}]^2 - \frac{[\text{s\_0214}] \cdot [\text{s\_0543}]}{\text{Keq}} \right)}{\text{Km0941}^2}}{\left(1 + \frac{[\text{s\_0941}]}{\text{Km0941}}\right)^2 + \left(1 + \frac{[\text{s\_0214}]}{\text{Km0214}}\right) \cdot \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) - 1} \tag{379}$$

Table 760: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338475820775 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.48673866149085 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0941		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0214		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.190 Reaction r_0741

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name GMP synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1101} + \text{s\_1799} \xrightleftharpoons{\text{e\_0795, s\_0467, s\_1101, s\_1799, s\_0454, s\_1095, s\_0942, s\_0783}} \text{s\_0454} + \text{s\_1095} + \text{s\_094}$$

(380)

Reactants

Table 761: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1101	L-Glutamine	
s_1799	Xanthosine 5'-phosphate	

Modifiers

Table 762: Properties of each modifier.

Id	Name	SBO
e_0795	guaA	0000460
s_0467	ATP	
s_1101	L-Glutamine	
s_1799	Xanthosine 5'-phosphate	
s_0454	AMP	
s_1095	L-Glutamate	
s_0942	GMP	
s_0783	Diphosphate	

Products

Table 763: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1095	L-Glutamate	
s_0942	GMP	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{190} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1101}] \cdot [\mathrm{s\_1799}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_1095}] \cdot [\mathrm{s\_0942}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1101} \cdot \mathrm{Km1799}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1101}]}{\mathrm{Km1101}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1799}]}{\mathrm{Km1799}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0942}]}{\mathrm{Km0942}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) -} \quad (381)$$

Table 764: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	1.553	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1101		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1799		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0454		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1095		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0942		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.191 Reaction r_0744

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name GTP cyclohydrolase I

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0945} \xrightleftharpoons{\mathrm{e\_0657,\ s\_0945,\ s\_0191,\ s\_0867}} \mathrm{s\_0191} + \mathrm{s\_0867} \quad (382)$$

Reactant

Table 765: Properties of each reactant.

Id	Name	SBO
s_0945	GTP	

Modifiers

Table 766: Properties of each modifier.

Id	Name	SBO
e_0657	folE	0000460
s_0945	GTP	
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	
s_0867	Formate	

Products

Table 767: Properties of each product.

Id	Name	SBO
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	
s_0867	Formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{191} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0945}] - \frac{[\mathrm{s\_0191}] \cdot [\mathrm{s\_0867}]}{\mathrm{Keq}} \right)}{\mathrm{Km0945}}}{1 + \frac{[\mathrm{s\_0945}]}{\mathrm{Km0945}} + \left(1 + \frac{[\mathrm{s\_0191}]}{\mathrm{Km0191}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0867}]}{\mathrm{Km0867}}\right) - 1} \tag{383}$$

Table 768: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0945		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0191		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0867		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.192 Reaction r_0745

This is a reversible reaction of one reactant forming three products influenced by five modifiers.

Name GTP cyclohydrolase II (25drapp)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0945} \xrightleftharpoons{\mathrm{e\_0432,\ s\_0945,\ s\_0160,\ s\_0867,\ s\_0783}} \mathrm{s\_0160} + \mathrm{s\_0867} + \mathrm{s\_0783} \qquad (384)$$

Reactant

Table 769: Properties of each reactant.

Id	Name	SBO
s_0945	GTP	

Modifiers

Table 770: Properties of each modifier.

Id	Name	SBO
e_0432	ribA	0000460
s_0945	GTP	
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	
s_0867	Formate	
s_0783	Diphosphate	

Products

Table 771: Properties of each product.

Id	Name	SBO
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	
s_0867	Formate	

Id	Name	SBO
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{192} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0945}] - \frac{[\text{s\_0160}] \cdot [\text{s\_0867}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0945}}}{1 + \frac{[\text{s\_0945}]}{\text{Km0945}} + \left(1 + \frac{[\text{s\_0160}]}{\text{Km0160}}\right) \cdot \left(1 + \frac{[\text{s\_0867}]}{\text{Km0867}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{385}$$

Table 772: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	☑
Km0945		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0160		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0867		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.193 Reaction r_0754

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name guanylate kinase (GMP:ATP)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0942} \xrightleftharpoons{\text{e\_1130, s\_0467, s\_0942, s\_0421, s\_0896}} \text{s\_0421} + \text{s\_0896} \tag{386}$$

Reactants

Table 773: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0942	GMP	

Modifiers

Table 774: Properties of each modifier.

Id	Name	SBO
e_1130	gmk	0000460
s_0467	ATP	
s_0942	GMP	
s_0421	ADP	
s_0896	GDP	

Products

Table 775: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0896	GDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{193} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0942}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0896}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0942}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0942}]}{\mathrm{Km0942}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0896}]}{\mathrm{Km0896}}\right) - 1} \tag{387}$$

Table 776: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.473	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0942		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0896		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.194 Reaction r_0755

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name HCO3 equilibration reaction

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0543} \xrightleftharpoons{\text{e\_0060, e\_0116, s\_0543, s\_0474}} \text{s\_0474} \tag{388}$$

Reactant

Table 777: Properties of each reactant.

Id	Name	SBO
s_0543	CO2	

Modifiers

Table 778: Properties of each modifier.

Id	Name	SBO
e_0060	can	0000460
e_0116	cynT	0000460
s_0543	CO2	
s_0474	Bicarbonate	

Product

Table 779: Properties of each product.

Id	Name	SBO
s_0474	Bicarbonate	

Kinetic Law

Derived unit contains undeclared units

$$v_{194} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0543}] - \frac{[\text{s\_0474}]}{\text{Keq}} \right)}{\text{Km0543}}}{1 + \frac{[\text{s\_0543}]}{\text{Km0543}} + 1 + \frac{[\text{s\_0474}]}{\text{Km0474}} - 1} \tag{389}$$

Table 780: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.072	dimensionless	☑
Vmax		0000324	0.433	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0543		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0474		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.195 Reaction r_0761

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name hexokinase (D-fructose:ATP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0622} \xrightleftharpoons{\mathrm{e\_0139},\ \mathrm{s\_0467},\ \mathrm{s\_0622},\ \mathrm{s\_0421},\ \mathrm{s\_0627}} \mathrm{s\_0421} + \mathrm{s\_0627} \tag{390}$$

Reactants

Table 781: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0622	D-Fructose	

Modifiers

Table 782: Properties of each modifier.

Id	Name	SBO
e_0139	mak	0000460
s_0467	ATP	
s_0622	D-Fructose	
s_0421	ADP	
s_0627	D-Fructose 6-phosphate	

Products

Table 783: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0627	D-Fructose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{195} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0622}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0627}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0622}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0622}]}{\text{Km0622}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0627}]}{\text{Km0627}}\right) - 1} \tag{391}$$

Table 784: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.055	dimensionless	☑
Vmax		0000324	0.763	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0622		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0627		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.196 Reaction r_0762

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name hexokinase (D-glucose:ATP)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0657} \xrightleftharpoons{\text{e\_0743, s\_0467, s\_0657, s\_0421, s\_0663}} \text{s\_0421} + \text{s\_0663} \tag{392}$$

Reactants

Table 785: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0657	D-Glucose	

Modifiers

Table 786: Properties of each modifier.

Id	Name	SBO
e_0743	glk	0000460
s_0467	ATP	
s_0657	D-Glucose	
s_0421	ADP	
s_0663	D-Glucose 6-phosphate	

Products

Table 787: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0663	D-Glucose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{196} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0657}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0663}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0657}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0657}]}{\mathrm{Km0657}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0663}]}{\mathrm{Km0663}}\right) - 1} \tag{393}$$

Table 788: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.912	dimensionless	☑
Vmax		0000324	12.771	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0657		0000322	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑
Km0663		0000323	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑

6.197 Reaction r_0763

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name histidinol dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1109} + 2\,\mathrm{s\_1333} \xrightleftharpoons{\mathrm{e\_0606},\ \mathrm{s\_1109},\ \mathrm{s\_1333},\ \mathrm{s\_1106},\ \mathrm{s\_1334}} \mathrm{s\_1106} + 2\,\mathrm{s\_1334} \qquad (394)$$

Reactants

Table 789: Properties of each reactant.

Id	Name	SBO
s_1109	L-Histidinol	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 790: Properties of each modifier.

Id	Name	SBO
e_0606	hisD	0000460
s_1109	L-Histidinol	
s_1333	Nicotinamide adenine dinucleotide	
s_1106	L-Histidine	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 791: Properties of each product.

Id	Name	SBO
s_1106	L-Histidine	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{197} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1109}] \cdot [\text{s\_1333}]^2 - \frac{[\text{s\_1106}] \cdot [\text{s\_1334}]^2}{\text{Keq}} \right)}{\text{Km1109} \cdot \text{Km1333}^2}}{\left(1 + \frac{[\text{s\_1109}]}{\text{Km1109}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right)^2 + \left(1 + \frac{[\text{s\_1106}]}{\text{Km1106}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right)^2 - 1} \tag{395}$$

Table 792: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.394	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1109		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1106		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.198 Reaction r_0764

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name histidinol-phosphatase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1110} \xrightleftharpoons{\text{e\_0608, s\_1110, s\_1109, s\_1430}} \text{s\_1109} + \text{s\_1430} \tag{396}$$

Reactant

Table 793: Properties of each reactant.

Id	Name	SBO
s_1110	L-Histidinol phosphate	

Modifiers

Table 794: Properties of each modifier.

Id	Name	SBO
e_0608	hisB	0000460
s_1110	L-Histidinol phosphate	
s_1109	L-Histidinol	
s_1430	Phosphate	

Products

Table 795: Properties of each product.

Id	Name	SBO
s_1109	L-Histidinol	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{198} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1110}] - \frac{[\text{s\_1109}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km1110}}}{1 + \frac{[\text{s\_1110}]}{\text{Km1110}} + \left(1 + \frac{[\text{s\_1109}]}{\text{Km1109}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{397}$$

Table 796: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.131	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1110		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1109		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.199 Reaction r_0765

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name histidinol-phosphate transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1095} + \text{s\_0263} \xrightleftharpoons{\text{e\_0607, s\_1095, s\_0263, s\_0233, s\_1110}} \text{s\_0233} + \text{s\_1110} \tag{398}$$

Reactants

Table 797: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	

Modifiers

Table 798: Properties of each modifier.

Id	Name	SBO
e_0607	hisC	0000460
s_1095	L-Glutamate	
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	
s_0233	2-Oxoglutarate	
s_1110	L-Histidinol phosphate	

Products

Table 799: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1110	L-Histidinol phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{199} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1095}] \cdot [\mathrm{s\_0263}] - \frac{[\mathrm{s\_0233}] \cdot [\mathrm{s\_1110}]}{\mathrm{Keq}} \right)}{\mathrm{Km1095} \cdot \mathrm{Km0263}}}{\left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0263}]}{\mathrm{Km0263}}\right) + \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1110}]}{\mathrm{Km1110}}\right) - 1} \tag{399}$$

Table 800: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.184	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1095		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0263		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0233		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1110		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.200 Reaction r_0769

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name homoserine dehydrogenase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1075} + \mathrm{s\_1336} \xrightleftharpoons{\mathrm{e\_0001,\ e\_1233,\ s\_1075,\ s\_1336,\ s\_1113,\ s\_1335}} \mathrm{s\_1113} + \mathrm{s\_1335} \tag{400}$$

Reactants

Table 801: Properties of each reactant.

Id	Name	SBO
s_1075	L-Aspartate 4-semialdehyde	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 802: Properties of each modifier.

Id	Name	SBO
e_0001	thrA	0000460

Id	Name	SBO
e_1233	metL	0000460
s_1075	L-Aspartate 4-semialdehyde	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1113	L-Homoserine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 803: Properties of each product.

Id	Name	SBO
s_1113	L-Homoserine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{200} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1075}] \cdot [\text{s\_1336}] - \frac{[\text{s\_1113}] \cdot [\text{s\_1335}]}{\text{Keq}} \right)}{\text{Km1075} \cdot \text{Km1336}}}{\left(1 + \frac{[\text{s\_1075}]}{\text{Km1075}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) + \left(1 + \frac{[\text{s\_1113}]}{\text{Km1113}}\right) \cdot \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) - 1} \tag{401}$$

Table 804: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.180	dimensionless	☑
Vmax		0000324	2.514	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1075		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1113		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.201 Reaction r_0770

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name homoserine kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1113} \xrightleftharpoons{\text{e\_0002, s\_0467, s\_1113, s\_0421, s\_1363}} \text{s\_0421} + \text{s\_1363} \tag{402}$$

Reactants

Table 805: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1113	L-Homoserine	

Modifiers

Table 806: Properties of each modifier.

Id	Name	SBO
e_0002	thrB	0000460
s_0467	ATP	
s_1113	L-Homoserine	
s_0421	ADP	
s_1363	O-Phospho-L-homoserine	

Products

Table 807: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1363	O-Phospho-L-homoserine	

Kinetic Law

Derived unit contains undeclared units

$$v_{201} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1113}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1363}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1113}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1113}]}{\text{Km1113}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1363}]}{\text{Km1363}}\right) - 1} \tag{403}$$

Table 808: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.158	dimensionless	☑
Vmax		0000324	2.215	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1113		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1363		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.202 Reaction r_0771

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name homoserine O-succinyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1113} + \mathrm{s\_1599} \xrightleftharpoons{\mathrm{e\_1259,\ s\_1113,\ s\_1599,\ s\_0555,\ s\_1367}} \mathrm{s\_0555} + \mathrm{s\_1367} \tag{404}$$

Reactants

Table 809: Properties of each reactant.

Id	Name	SBO
s_1113	L-Homoserine	
s_1599	Succinyl-CoA	

Modifiers

Table 810: Properties of each modifier.

Id	Name	SBO
e_1259	metA	0000460
s_1113	L-Homoserine	
s_1599	Succinyl-CoA	
s_0555	Coenzyme A	
s_1367	O-Succinyl-L-homoserine	

Products

Table 811: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_1367	O-Succinyl-L-homoserine	

Kinetic Law

Derived unit contains undeclared units

$$v_{202} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1113}] \cdot [\mathrm{s\_1599}] - \frac{[\mathrm{s\_0555}] \cdot [\mathrm{s\_1367}]}{\mathrm{Keq}} \right)}{\mathrm{Km1113} \cdot \mathrm{Km1599}}}{\left(1 + \frac{[\mathrm{s\_1113}]}{\mathrm{Km1113}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1599}]}{\mathrm{Km1599}}\right) + \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1367}]}{\mathrm{Km1367}}\right) - 1} \tag{405}$$

Table 812: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑
Vmax		0000324	0.298	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1113		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1599		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0555		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1367		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.203 Reaction r_0775

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Hydroxybenzoate octaprenyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0325} + \mathrm{s\_0435} \xrightleftharpoons{\mathrm{e\_1272,\ s\_0325,\ s\_0435,\ s\_0283,\ s\_0783}} \mathrm{s\_0283} + \mathrm{s\_0783} \tag{406}$$

Reactants

Table 813: Properties of each reactant.

Id	Name	SBO
s_0325	4-Hydroxybenzoate	
s_0435	all-trans-Octaprenyl diphosphate	

Modifiers

Table 814: Properties of each modifier.

Id	Name	SBO
e_1272	ubiA	0000460
s_0325	4-Hydroxybenzoate	
s_0435	all-trans-Octaprenyl diphosphate	
s_0283	3-Octaprenyl-4-hydroxybenzoate	
s_0783	Diphosphate	

Products

Table 815: Properties of each product.

Id	Name	SBO
s_0283	3-Octaprenyl-4-hydroxybenzoate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{203} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0325}] \cdot [\mathrm{s\_0435}] - \frac{[\mathrm{s\_0283}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0325} \cdot \mathrm{Km0435}}}{\left(1 + \frac{[\mathrm{s\_0325}]}{\mathrm{Km0325}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0435}]}{\mathrm{Km0435}}\right) + \left(1 + \frac{[\mathrm{s\_0283}]}{\mathrm{Km0283}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{407}$$

Table 816: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0325		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0435		0000322	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑
Km0283		0000323	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑

6.204 Reaction r_0777

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name hydroxymethylbilane synthase

SBO:0000176 biochemical reaction

Reaction equation

$$4\,\mathrm{s\_1493} \xrightleftharpoons{\mathrm{e\_1186},\ \mathrm{s\_1493},\ \mathrm{s\_0998},\ \mathrm{s\_0451}} \mathrm{s\_0998} + 4\,\mathrm{s\_0451} \tag{408}$$

Reactant

Table 817: Properties of each reactant.

Id	Name	SBO
s_1493	Porphobilinogen	

Modifiers

Table 818: Properties of each modifier.

Id	Name	SBO
e_1186	hemC	0000460
s_1493	Porphobilinogen	
s_0998	Hydroxymethylbilane	
s_0451	Ammonium	

Products

Table 819: Properties of each product.

Id	Name	SBO
s_0998	Hydroxymethylbilane	
s_0451	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{204} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1493}]^4 - \frac{[\text{s\_0998}] \cdot [\text{s\_0451}]^4}{\text{Keq}} \right)}{\text{Km1493}^4}}{\left(1 + \frac{[\text{s\_1493}]}{\text{Km1493}}\right)^4 + \left(1 + \frac{[\text{s\_0998}]}{\text{Km0998}}\right) \cdot \left(1 + \frac{[\text{s\_0451}]}{\text{Km0451}}\right)^4 - 1} \tag{409}$$

Table 820: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.1778463445417 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1493		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0998		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0451		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.205 Reaction r_0784

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name Imidazole-glycerol-3-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1101} + \text{s\_0341} \xrightleftharpoons{\text{e\_0611, e\_0609, s\_1101, s\_0341, s\_0343, s\_0620, s\_1095}} \text{s\_0343} + \text{s\_0620} + \text{s\_1095} \tag{410}$$

Reactants

Table 821: Properties of each reactant.

Id	Name
s_1101	L-Glutamine
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxa

Modifiers

Table 822: Properties of each modifier.

Id	Name
e_0611	hisF
e_0609	hisH
s_1101	L-Glutamine
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxa
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate
s_1095	L-Glutamate

Products

Table 823: Properties of each product.

Id	Name	SBO
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	
s_1095	L-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{205} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1101}] \cdot [\mathrm{s\_0341}] - \frac{[\mathrm{s\_0343}] \cdot [\mathrm{s\_0620}] \cdot [\mathrm{s\_1095}]}{\mathrm{Keq}} \right)}{\mathrm{Km1101} \cdot \mathrm{Km0341}}}{\left(1 + \frac{[\mathrm{s\_1101}]}{\mathrm{Km1101}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0341}]}{\mathrm{Km0341}}\right) + \left(1 + \frac{[\mathrm{s\_0343}]}{\mathrm{Km0343}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0620}]}{\mathrm{Km0620}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) - 1} \tag{411}$$

Table 824: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.289	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1101		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0341		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0343		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0620		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1095		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.206 Reaction r_0785

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name imidazoleglycerol-phosphate dehydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0620} \xrightleftharpoons{\text{e\_0608, s\_0620, s\_0263}} \text{s\_0263} \tag{412}$$

Reactant

Table 825: Properties of each reactant.

Id	Name	SBO
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	

Modifiers

Table 826: Properties of each modifier.

Id	Name	SBO
e_0608	hisB	0000460
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	

Product

Table 827: Properties of each product.

Id	Name	SBO
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{206} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0620}] - \frac{[\text{s\_0263}]}{\text{Keq}} \right)}{\text{Km0620}}}{1 + \frac{[\text{s\_0620}]}{\text{Km0620}} + 1 + \frac{[\text{s\_0263}]}{\text{Km0263}} - 1} \tag{413}$$

Table 828: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.079	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0620		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0263		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.207 Reaction r_0786

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name IMP cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0352} \xrightleftharpoons{\mathrm{e\_1258,\ s\_0352,\ s\_1006}} \mathrm{s\_1006} \tag{414}$$

Reactant

Table 829: Properties of each reactant.

Id	Name	SBO
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	

Modifiers

Table 830: Properties of each modifier.

Id	Name	SBO
e_1258	purH	0000460
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	
s_1006	IMP	

Product

Table 831: Properties of each product.

Id	Name	SBO
s_1006	IMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{207} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0352}] - \frac{[\text{s\_1006}]}{\text{Keq}} \right)}{\text{Km0352}}}{1 + \frac{[\text{s\_0352}]}{\text{Km0352}} + 1 + \frac{[\text{s\_1006}]}{\text{Km1006}} - 1} \tag{415}$$

Table 832: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.075	dimensionless	☑
Vmax		0000324	0.447	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0352		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1006		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.208 Reaction r_0787

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name IMP dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1006} + \text{s\_1333} \underset{\leftarrow}{\overset{\text{e\_0796, s\_1006, s\_1333, s\_1334, s\_1799}}{\rightleftharpoons}} \text{s\_1334} + \text{s\_1799} \tag{416}$$

Reactants

Table 833: Properties of each reactant.

Id	Name	SBO
s_1006	IMP	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 834: Properties of each modifier.

Id	Name	SBO
e_0796	guaB	0000460
s_1006	IMP	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1799	Xanthosine 5'-phosphate	

Products

Table 835: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1799	Xanthosine 5'-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{208} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1006}] \cdot [\mathrm{s\_1333}] - \frac{[\mathrm{s\_1334}] \cdot [\mathrm{s\_1799}]}{\mathrm{Keq}} \right)}{\mathrm{Km1006} \cdot \mathrm{Km1333}}}{\left(1 + \frac{[\mathrm{s\_1006}]}{\mathrm{Km1006}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) + \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1799}]}{\mathrm{Km1799}}\right) - 1} \tag{417}$$

Table 836: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.473	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1006		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1799		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.209 Reaction r_0788

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name indole-3-glycerol-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0096} \xrightleftharpoons{\text{e\_0427, s\_0096, s\_0493, s\_0543}} \text{s\_0493} + \text{s\_0543} \tag{418}$$

Reactant

Table 837: Properties of each reactant.

Id	Name	SBO
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Modifiers

Table 838: Properties of each modifier.

Id	Name	SBO
e_0427	trpC	0000460
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	
s_0543	CO2	

Products

Table 839: Properties of each product.

Id	Name	SBO
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{209} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0096}] - \frac{[\mathrm{s\_0493}] \cdot [\mathrm{s\_0543}]}{\mathrm{Keq}} \right)}{\mathrm{Km0096}}}{1 + \frac{[\mathrm{s\_0096}]}{\mathrm{Km0096}} + \left(1 + \frac{[\mathrm{s\_0493}]}{\mathrm{Km0493}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) - 1} \tag{419}$$

Table 840: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	☑
Vmax		0000324	0.079	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0096		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0493		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0543		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.210 Reaction r_0796

This is a reversible reaction of three reactants forming two products influenced by seven modifiers.

Name ISC [2Fe-2S] regeneration

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0377} + \mathrm{s\_1018} + \mathrm{s\_1019} \xrightleftharpoons{\mathrm{e\_0805,\ e\_0804,\ s\_0377,\ s\_1018,\ s\_1019,\ s\_1017,\ s\_1020}} \mathrm{s\_1017} + \mathrm{s\_1020} \tag{420}$$

Reactants

Table 841: Properties of each reactant.

Id	Name	SBO
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	
s_1018	IscS with bound sulfur	
s_1019	IscU scaffold protein	

Modifiers

Table 842: Properties of each modifier.

Id	Name	SBO
e_0805	iscS	0000460
e_0804	nifU	0000460
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	
s_1018	IscS with bound sulfur	
s_1019	IscU scaffold protein	
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Products

Table 843: Properties of each product.

Id	Name	SBO
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Kinetic Law

Derived unit contains undeclared units

$$v_{210} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0377}] \cdot [\text{s\_1018}] \cdot [\text{s\_1019}] - \frac{[\text{s\_1017}] \cdot [\text{s\_1020}]}{\text{Keq}} \right)}{\text{Km0377} \cdot \text{Km1018} \cdot \text{Km1019}}}{\left(1 + \frac{[\text{s\_0377}]}{\text{Km0377}}\right) \cdot \left(1 + \frac{[\text{s\_1018}]}{\text{Km1018}}\right) \cdot \left(1 + \frac{[\text{s\_1019}]}{\text{Km1019}}\right) + \left(1 + \frac{[\text{s\_1017}]}{\text{Km1017}}\right) \cdot \left(1 + \frac{[\text{s\_1020}]}{\text{Km1020}}\right) - 1} \tag{421}$$

Table 844: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467753811 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$6.09473629058384 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km0377		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1018		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1019		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1017		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1020		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.211 Reaction r_0797

This is a reversible reaction of four reactants forming three products influenced by ten modifiers.

Name ISC [2Fe-2S] Synthesis

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0860} + 2\,\mathrm{s\_0838} + 2\,\mathrm{s\_1018} + \mathrm{s\_1019} \xrightleftharpoons{\mathrm{e\_0804},\ \mathrm{e\_1188},\ \mathrm{e\_0805},\ \mathrm{s\_0860},\ \mathrm{s\_0838},\ \mathrm{s\_1018},\ \mathrm{s\_1019},\ \mathrm{s\_0859},\ \mathrm{s\_1017},\ \mathrm{s\_1}}$$

(422)

Reactants

Table 845: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1019	IscU scaffold protein	

Modifiers

Table 846: Properties of each modifier.

Id	Name	SBO
e_0804	nifU	0000460
e_1188	cyaY	0000460
e_0805	iscS	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1019	IscU scaffold protein	
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Products

Table 847: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Kinetic Law

Derived unit contains undeclared units

$$v_{211} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0860}] \cdot [\mathrm{s\_0838}]^2 \cdot [\mathrm{s\_1018}]^2 \cdot [\mathrm{s\_1019}] - \frac{[\mathrm{s\_0859}] \cdot [\mathrm{s\_1017}]^2 \cdot [\mathrm{s\_1020}]}{\mathrm{Keq}} \right)}{\mathrm{Km0860} \cdot \mathrm{Km0838}^2 \cdot \mathrm{Km1018}^2 \cdot \mathrm{Km1019}}}{\left(1 + \frac{[\mathrm{s\_0860}]}{\mathrm{Km0860}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0838}]}{\mathrm{Km0838}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_1018}]}{\mathrm{Km1018}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_1019}]}{\mathrm{Km1019}}\right) + \left(1 + \frac{[\mathrm{s\_0859}]}{\mathrm{Km0859}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1017}]}{\mathrm{Km1017}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_1020}]}{\mathrm{Km1020}}\right.} \quad (423)$$

Table 848: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.96157859771697 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.006	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	200.000	$\mathrm{mmol}^{-2} \cdot \mathrm{l}^2$	☑
Km0860		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0838		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1018		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1019		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0859		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1017		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1020		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.212 Reaction r_0798

This is a reversible reaction of four reactants forming three products influenced by ten modifiers.

Name ISC [2Fe-2S] Synthesis II

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0860} + 2\,\mathrm{s\_0838} + 2\,\mathrm{s\_1018} + \mathrm{s\_1020} \xrightleftharpoons{\mathrm{e\_0804,\ e\_1188,\ e\_0805,\ s\_0860,\ s\_0838,\ s\_1018,\ s\_1020,\ s\_0859,\ s\_1017,\ s\_1}} \quad (424)$$

Reactants

Table 849: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1020	IscU with bound [2Fe-2S] cluster	

Modifiers

Table 850: Properties of each modifier.

Id	Name	SBO
e_0804	nifU	0000460
e_1188	cyaY	0000460
e_0805	iscS	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1020	IscU with bound [2Fe-2S] cluster	
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1022	IscU with two bound [2Fe-2S] clusters	

Products

Table 851: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1022	IscU with two bound [2Fe-2S] clusters	

Kinetic Law

Derived unit contains undeclared units

$$v_{212} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0860}] \cdot [\text{s\_0838}]^2 \cdot [\text{s\_1018}]^2 \cdot [\text{s\_1020}] - \frac{[\text{s\_0859}] \cdot [\text{s\_1017}]^2 \cdot [\text{s\_1022}]}{\text{Keq}} \right)}{\text{Km0860} \cdot \text{Km0838}^2 \cdot \text{Km1018}^2 \cdot \text{Km1020}}}{\left(1 + \frac{[\text{s\_0860}]}{\text{Km0860}}\right) \cdot \left(1 + \frac{[\text{s\_0838}]}{\text{Km0838}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1018}]}{\text{Km1018}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1020}]}{\text{Km1020}}\right) + \left(1 + \frac{[\text{s\_0859}]}{\text{Km0859}}\right) \cdot \left(1 + \frac{[\text{s\_1017}]}{\text{Km1017}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1022}]}{\text{Km1022}}\right)} \tag{425}$$

Table 852: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.60143508877284 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	200.000	$\text{mmol}^{-2} \cdot \text{l}^2$	☑
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0838		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1018		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1020		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1017		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1022		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.213 Reaction r_0799

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name ISC [2Fe-2S] Transfer

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1020} \xrightleftharpoons{\text{e\_0803, e\_0804, s\_1020, s\_0378, s\_1019}} \text{s\_0378} + \text{s\_1019} \tag{426}$$

Reactant

Table 853: Properties of each reactant.

Id	Name	SBO
s_1020	IscU with bound [2Fe-2S] cluster	

Modifiers

Table 854: Properties of each modifier.

Id	Name	SBO
e_0803	iscA	0000460
e_0804	nifU	0000460
s_1020	IscU with bound [2Fe-2S] cluster	
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Products

Table 855: Properties of each product.

Id	Name	SBO
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{213} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1020}] - \frac{[\mathrm{s\_0378}] \cdot [\mathrm{s\_1019}]}{\mathrm{Keq}} \right)}{\mathrm{Km1020}}}{1 + \frac{[\mathrm{s\_1020}]}{\mathrm{Km1020}} + \left(1 + \frac{[\mathrm{s\_0378}]}{\mathrm{Km0378}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1019}]}{\mathrm{Km1019}}\right) - 1} \tag{427}$$

Table 856: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.87846855703637 \cdot 10^{-6}$	dimensionless	☑
Vmax		0000324	$3.87846855703637 \cdot 10^{-5}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1020		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0378		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1019		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.214 Reaction r_0800

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ISC [4Fe-4S] Reduction

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0860} + \text{s\_1022} \xrightleftharpoons{\text{e\_0804, s\_0860, s\_1022, s\_0859, s\_1021}} \text{s\_0859} + \text{s\_1021} \tag{428}$$

Reactants

Table 857: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1022	IscU with two bound [2Fe-2S] clusters	

Modifiers

Table 858: Properties of each modifier.

Id	Name	SBO
e_0804	nifU	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1022	IscU with two bound [2Fe-2S] clusters	
s_0859	Flavin adenine dinucleotide oxidized	
s_1021	IscU with bound [4Fe-4S] cluster	

Products

Table 859: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1021	IscU with bound [4Fe-4S] cluster	

Kinetic Law

Derived unit contains undeclared units

$$v_{214} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0860}] \cdot [\text{s\_1022}] - \frac{[\text{s\_0859}] \cdot [\text{s\_1021}]}{\text{Keq}} \right)}{\text{Km0860} \cdot \text{Km1022}}}{\left(1 + \frac{[\text{s\_0860}]}{\text{Km0860}}\right) \cdot \left(1 + \frac{[\text{s\_1022}]}{\text{Km1022}}\right) + \left(1 + \frac{[\text{s\_0859}]}{\text{Km0859}}\right) \cdot \left(1 + \frac{[\text{s\_1021}]}{\text{Km1021}}\right) - 1} \tag{429}$$

Table 860: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.60143508877284 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$5.04200912428198 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0860		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1022		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0859		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1021		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.215 Reaction r_0801

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name ISC [4Fe-4S] Transfer

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1021} \xrightleftharpoons{\mathrm{e\_0803,\ e\_0804,\ s\_1021,\ s\_0380,\ s\_1019}} \mathrm{s\_0380} + \mathrm{s\_1019} \tag{430}$$

Reactant

Table 861: Properties of each reactant.

Id	Name	SBO
s_1021	IscU with bound [4Fe-4S] cluster	

Modifiers

Table 862: Properties of each modifier.

Id	Name	SBO
e_0803	iscA	0000460
e_0804	nifU	0000460
s_1021	IscU with bound [4Fe-4S] cluster	
s_0380	[4Fe-4S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Products

Table 863: Properties of each product.

Id	Name	SBO
s_0380	[4Fe-4S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{215} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1021}] - \frac{[\text{s\_0380}] \cdot [\text{s\_1019}]}{\text{Keq}} \right)}{\text{Km1021}}}{1 + \frac{[\text{s\_1021}]}{\text{Km1021}} + \left(1 + \frac{[\text{s\_0380}]}{\text{Km0380}}\right) \cdot \left(1 + \frac{[\text{s\_1019}]}{\text{Km1019}}\right) - 1} \tag{431}$$

Table 864: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.60143508877284 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.60143508877284 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1021		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0380		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1019		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.216 Reaction r_0802

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ISC Cysteine desulfuration

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1083} + \text{s\_1017} \xrightleftharpoons{\text{e\_0805, s\_1083, s\_1017, s\_1041, s\_1018}} \text{s\_1041} + \text{s\_1018} \tag{432}$$

Reactants

Table 865: Properties of each reactant.

Id	Name	SBO
s_1083	L-Cysteine	
s_1017	IscS sulfur acceptor protein	

Modifiers

Table 866: Properties of each modifier.

Id	Name	SBO
e_0805	iscS	0000460
s_1083	L-Cysteine	
s_1017	IscS sulfur acceptor protein	
s_1041	L-Alanine	
s_1018	IscS with bound sulfur	

Products

Table 867: Properties of each product.

Id	Name	SBO
s_1041	L-Alanine	
s_1018	IscS with bound sulfur	

Kinetic Law

Derived unit contains undeclared units

$$v_{216} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1083}] \cdot [\text{s\_1017}] - \frac{[\text{s\_1041}] \cdot [\text{s\_1018}]}{\text{Keq}} \right)}{\text{Km1083} \cdot \text{Km1017}}}{\left(1 + \frac{[\text{s\_1083}]}{\text{Km1083}}\right) \cdot \left(1 + \frac{[\text{s\_1017}]}{\text{Km1017}}\right) + \left(1 + \frac{[\text{s\_1041}]}{\text{Km1041}}\right) \cdot \left(1 + \frac{[\text{s\_1018}]}{\text{Km1018}}\right) - 1} \tag{433}$$

Table 868: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.50022705200688 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1083		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1017		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1041		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1018		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.217 Reaction r_0806

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name isocitrate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1027} + \mathrm{s\_1335} \xrightleftharpoons{\mathrm{e\_0391,\ s\_1027,\ s\_1335,\ s\_0233,\ s\_0543,\ s\_1336}} \mathrm{s\_0233} + \mathrm{s\_0543} + \mathrm{s\_1336} \tag{434}$$

Reactants

Table 869: Properties of each reactant.

Id	Name	SBO
s_1027	Isocitrate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 870: Properties of each modifier.

Id	Name	SBO
e_0391	icd	0000460
s_1027	Isocitrate	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0233	2-Oxoglutarate	
s_0543	CO2	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 871: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_0543	CO2	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{217} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1027}] \cdot [\mathrm{s\_1335}] - \frac{[\mathrm{s\_0233}] \cdot [\mathrm{s\_0543}] \cdot [\mathrm{s\_1336}]}{\mathrm{Keq}} \right)}{\mathrm{Km1027} \cdot \mathrm{Km1335}}}{\left(1 + \frac{[\mathrm{s\_1027}]}{\mathrm{Km1027}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) + \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) - 1} \tag{435}$$

Table 872: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	☑
Vmax		0000324	3.277	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1027		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0233		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0543		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1336		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.218 Reaction r_0808

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name isoleucine transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0051} + \mathrm{s\_1095} \xrightleftharpoons{\mathrm{e\_1167,\ s\_0051,\ s\_1095,\ s\_0233,\ s\_1119}} \mathrm{s\_0233} + \mathrm{s\_1119} \tag{436}$$

Reactants

Table 873: Properties of each reactant.

Id	Name	SBO
s_0051	(S)-3-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	

Modifiers

Table 874: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
s_0051	(S)-3-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1119	L-Isoleucine	

Products

Table 875: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1119	L-Isoleucine	

Kinetic Law

Derived unit contains undeclared units

$$v_{218} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0051}] \cdot [\mathrm{s\_1095}] - \frac{[\mathrm{s\_0233}] \cdot [\mathrm{s\_1119}]}{\mathrm{Keq}} \right)}{\mathrm{Km0051} \cdot \mathrm{Km1095}}}{\left(1 + \frac{[\mathrm{s\_0051}]}{\mathrm{Km0051}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) + \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1119}]}{\mathrm{Km1119}}\right) - 1} \tag{437}$$

Table 876: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	☑
Vmax		0000324	0.563	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0051		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1095		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0233		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1119		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.219 Reaction r_0811

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ketol-acid reductoisomerase (2,3-dihydroxy-3-methylbutanoate)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0042} + \mathrm{s\_1336} \xrightleftharpoons{\mathrm{e\_1170},\ \mathrm{s\_0042},\ \mathrm{s\_1336},\ \mathrm{s\_0017},\ \mathrm{s\_1335}} \mathrm{s\_0017} + \mathrm{s\_1335} \tag{438}$$

Reactants

Table 877: Properties of each reactant.

Id	Name	SBO
s_0042	(S)-2-Acetolactate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 878: Properties of each modifier.

Id	Name	SBO
e_1170	ilvC	0000460
s_0042	(S)-2-Acetolactate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 879: Properties of each product.

Id	Name	SBO
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{219} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0042}] \cdot [\text{s\_1336}] - \frac{[\text{s\_0017}] \cdot [\text{s\_1335}]}{\text{Keq}} \right)}{\text{Km0042} \cdot \text{Km1336}}}{\left(1 + \frac{[\text{s\_0042}]}{\text{Km0042}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) + \left(1 + \frac{[\text{s\_0017}]}{\text{Km0017}}\right) \cdot \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) - 1} \tag{439}$$

Table 880: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	☑
Vmax		0000324	1.695	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0042		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0017		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.220 Reaction r_0812

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ketol-acid reductoisomerase (2-Acetolactate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0041} + \text{s\_1336} \xrightleftharpoons{\text{e\_1170, s\_0041, s\_1336, s\_0018, s\_1335}} \text{s\_0018} + \text{s\_1335} \tag{440}$$

Reactants

Table 881: Properties of each reactant.

Id	Name	SBO
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 882: Properties of each modifier.

Id	Name	SBO
e_1170	ilvC	0000460
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 883: Properties of each product.

Id	Name	SBO
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{220} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0041}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_0018}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km0041} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0041}]}{\mathrm{Km0041}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_0018}]}{\mathrm{Km0018}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{441}$$

Table 884: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	☑
Vmax		0000324	0.563	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0041		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0018		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.221 Reaction r_0815

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name L-alanine transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1095} + \mathrm{s\_1531} \xrightleftharpoons{\mathrm{e\_0742},\ \mathrm{e\_0717},\ \mathrm{s\_1095},\ \mathrm{s\_1531},\ \mathrm{s\_0233},\ \mathrm{s\_1041}} \mathrm{s\_0233} + \mathrm{s\_1041} \qquad (442)$$

Reactants

Table 885: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1531	Pyruvate	

Modifiers

Table 886: Properties of each modifier.

Id	Name	SBO
e_0742	yfdZ	0000460
e_0717	yfbQ	0000460
s_1095	L-Glutamate	
s_1531	Pyruvate	
s_0233	2-Oxoglutarate	
s_1041	L-Alanine	

Products

Table 887: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1041	L-Alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{221} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1095}] \cdot [\text{s\_1531}] - \frac{[\text{s\_0233}] \cdot [\text{s\_1041}]}{\text{Keq}} \right)}{\text{Km1095} \cdot \text{Km1531}}}{\left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) + \left(1 + \frac{[\text{s\_0233}]}{\text{Km0233}}\right) \cdot \left(1 + \frac{[\text{s\_1041}]}{\text{Km1041}}\right) - 1} \tag{443}$$

Table 888: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.081	dimensionless	☑
Vmax		0000324	1.127	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1041		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.222 Reaction r_0829

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name L-aspartate oxidase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1072} + \text{s\_1372} \xrightleftharpoons{\text{e\_0819, s\_1072, s\_1372, s\_0991, s\_1005}} \text{s\_0991} + \text{s\_1005} \tag{444}$$

Reactants

Table 889: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_1372	O2	

Modifiers

Table 890: Properties of each modifier.

Id	Name	SBO
e_0819	nadB	0000460
s_1072	L-Aspartate	
s_1372	O2	
s_0991	Hydrogen peroxide	
s_1005	Iminoaspartate	

Products

Table 891: Properties of each product.

Id	Name	SBO
s_0991	Hydrogen peroxide	
s_1005	Iminoaspartate	

Kinetic Law

Derived unit contains undeclared units

$$v_{222} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1072}] \cdot [\text{s\_1372}] - \frac{[\text{s\_0991}] \cdot [\text{s\_1005}]}{\text{Keq}} \right)}{\text{Km1072} \cdot \text{Km1372}}}{\left(1 + \frac{[\text{s\_1072}]}{\text{Km1072}}\right) \cdot \left(1 + \frac{[\text{s\_1372}]}{\text{Km1372}}\right) + \left(1 + \frac{[\text{s\_0991}]}{\text{Km0991}}\right) \cdot \left(1 + \frac{[\text{s\_1005}]}{\text{Km1005}}\right) - 1} \tag{445}$$

Table 892: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120488056 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1372		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0991		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1005		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.223 Reaction r_0835

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name L-glutamate 5-semialdehyde dehydratase (spontaneous)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1100} \xrightleftharpoons{\mathrm{s\_1100},\ \mathrm{s\_0128}} \mathrm{s\_0128} \tag{446}$$

Reactant

Table 893: Properties of each reactant.

Id	Name	SBO
s_1100	L-Glutamate 5-semialdehyde	

Modifiers

Table 894: Properties of each modifier.

Id	Name	SBO
s_1100	L-Glutamate 5-semialdehyde	
s_0128	1-Pyrroline-5-carboxylate	

Product

Table 895: Properties of each product.

Id	Name	SBO
s_0128	1-Pyrroline-5-carboxylate	

Kinetic Law

Derived unit contains undeclared units

$$v_{223} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1100}] - \frac{[\text{s\_0128}]}{\text{Keq}} \right)}{\text{Km1100}}}{1 + \frac{[\text{s\_1100}]}{\text{Km1100}} + 1 + \frac{[\text{s\_0128}]}{\text{Km0128}} - 1} \tag{447}$$

Table 896: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	☑
Vmax		0000324	0.184	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1100		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0128		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.224 Reaction r_0847

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name L-threonine deaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1179} \xrightleftharpoons{\text{e\_1169, e\_0977, s\_1179, s\_0232, s\_0451}} \text{s\_0232} + \text{s\_0451} \tag{448}$$

Reactant

Table 897: Properties of each reactant.

Id	Name	SBO
s_1179	L-Threonine	

Modifiers

Table 898: Properties of each modifier.

Id	Name	SBO
e_1169	ilvA	0000460

Id	Name	SBO
e_0977	tdcB	0000460
s_1179	L-Threonine	
s_0232	2-Oxobutanoate	
s_0451	Ammonium	

Products

Table 899: Properties of each product.

Id	Name	SBO
s_0232	2-Oxobutanoate	
s_0451	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{224} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1179}] - \frac{[\mathrm{s\_0232}] \cdot [\mathrm{s\_0451}]}{\mathrm{Keq}} \right)}{\mathrm{Km1179}}}{1 + \frac{[\mathrm{s\_1179}]}{\mathrm{Km1179}} + \left(1 + \frac{[\mathrm{s\_0232}]}{\mathrm{Km0232}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0451}]}{\mathrm{Km0451}}\right) - 1} \tag{449}$$

Table 900: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	☑
Vmax		0000324	0.402	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1179		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0232		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0451		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.225 Reaction r_0848

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name L-threonine dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1333} + \text{s\_1179} \xrightleftharpoons{\text{e\_1109, s\_1333, s\_1179, s\_1040, s\_1334}} \text{s\_1040} + \text{s\_1334} \tag{450}$$

Reactants

Table 901: Properties of each reactant.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1179	L-Threonine	

Modifiers

Table 902: Properties of each modifier.

Id	Name	SBO
e_1109	tdh	0000460
s_1333	Nicotinamide adenine dinucleotide	
s_1179	L-Threonine	
s_1040	L-2-Amino-3-oxobutanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 903: Properties of each product.

Id	Name	SBO
s_1040	L-2-Amino-3-oxobutanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{225} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1333}] \cdot [\text{s\_1179}] - \frac{[\text{s\_1040}] \cdot [\text{s\_1334}]}{\text{Keq}} \right)}{\text{Km1333} \cdot \text{Km1179}}}{\left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) \cdot \left(1 + \frac{[\text{s\_1179}]}{\text{Km1179}}\right) + \left(1 + \frac{[\text{s\_1040}]}{\text{Km1040}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) - 1} \tag{451}$$

Table 904: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.580	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1333		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1179		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1040		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1334		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.226 Reaction r_0854

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name leucine transaminase (irreversible)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0328} + \mathrm{s\_1095} \xrightleftharpoons{\mathrm{e\_1167},\ \mathrm{e\_1276},\ \mathrm{s\_0328},\ \mathrm{s\_1095},\ \mathrm{s\_0233},\ \mathrm{s\_1127}} \mathrm{s\_0233} + \mathrm{s\_1127} \qquad (452)$$

Reactants

Table 905: Properties of each reactant.

Id	Name	SBO
s_0328	4-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	

Modifiers

Table 906: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
e_1276	tyrB	0000460
s_0328	4-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1127	L-Leucine	

Products

Table 907: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1127	L-Leucine	

Kinetic Law

Derived unit contains undeclared units

$$v_{226} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0328}] \cdot [\text{s\_1095}] - \frac{[\text{s\_0233}] \cdot [\text{s\_1127}]}{\text{Keq}} \right)}{\text{Km0328} \cdot \text{Km1095}}}{\left(1 + \frac{[\text{s\_0328}]}{\text{Km0328}}\right) \cdot \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) + \left(1 + \frac{[\text{s\_0233}]}{\text{Km0233}}\right) \cdot \left(1 + \frac{[\text{s\_1127}]}{\text{Km1127}}\right) - 1} \tag{453}$$

Table 908: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	☑
Vmax		0000324	0.874	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0328		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1127		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.227 Reaction r_0857

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Lipid A disaccaride synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0149} + \text{s\_1734} \xrightleftharpoons{\text{e\_0084, s\_0149, s\_1734, s\_1204, s\_1733}} \text{s\_1204} + \text{s\_1733} \tag{454}$$

Reactants

Table 909: Properties of each reactant.

Id	Name	SBO
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Modifiers

Table 910: Properties of each modifier.

Id	Name	SBO
e_0084	lpxB	0000460
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	
s_1204	Lipid A Disaccharide	
s_1733	UDP	

Products

Table 911: Properties of each product.

Id	Name	SBO
s_1204	Lipid A Disaccharide	
s_1733	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{227} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0149}] \cdot [\mathrm{s\_1734}] - \frac{[\mathrm{s\_1204}] \cdot [\mathrm{s\_1733}]}{\mathrm{Keq}} \right)}{\mathrm{Km0149} \cdot \mathrm{Km1734}}}{\left(1 + \frac{[\mathrm{s\_0149}]}{\mathrm{Km0149}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1734}]}{\mathrm{Km1734}}\right) + \left(1 + \frac{[\mathrm{s\_1204}]}{\mathrm{Km1204}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1733}]}{\mathrm{Km1733}}\right) - 1} \tag{455}$$

Table 912: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	☑
Vmax		0000324	0.038	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0149		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1734		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1204		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1733		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.228 Reaction r_0925

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name malate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1138} + \mathrm{s\_1333} \xrightleftharpoons{\mathrm{e\_1004},\ \mathrm{s\_1138},\ \mathrm{s\_1333},\ \mathrm{s\_1334},\ \mathrm{s\_1399}} \mathrm{s\_1334} + \mathrm{s\_1399} \tag{456}$$

Reactants

Table 913: Properties of each reactant.

Id	Name	SBO
s_1138	L-Malate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 914: Properties of each modifier.

Id	Name	SBO
e_1004	mdh	0000460
s_1138	L-Malate	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1399	Oxaloacetate	

Products

Table 915: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1399	Oxaloacetate	

Kinetic Law

Derived unit contains undeclared units

$$v_{228} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1138}] \cdot [\text{s\_1333}] - \frac{[\text{s\_1334}] \cdot [\text{s\_1399}]}{\text{Keq}} \right)}{\text{Km1138} \cdot \text{Km1333}}}{\left(1 + \frac{[\text{s\_1138}]}{\text{Km1138}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) + \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) \cdot \left(1 + \frac{[\text{s\_1399}]}{\text{Km1399}}\right) - 1} \tag{457}$$

Table 916: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.143	dimensionless	☑
Vmax		0000324	2.008	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1138		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1399		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.229 Reaction r_0928

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name malate oxidase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0991} + \text{s\_1399} \xrightleftharpoons{\text{s\_0991, s\_1399, s\_1138, s\_1372}} \text{s\_1138} + \text{s\_1372} \tag{458}$$

Reactants

Table 917: Properties of each reactant.

Id	Name	SBO
s_0991	Hydrogen peroxide	
s_1399	Oxaloacetate	

Modifiers

Table 918: Properties of each modifier.

Id	Name	SBO
s_0991	Hydrogen peroxide	
s_1399	Oxaloacetate	
s_1138	L-Malate	
s_1372	O2	

Products

Table 919: Properties of each product.

Id	Name	SBO
s_1138	L-Malate	
s_1372	O2	

Kinetic Law

Derived unit contains undeclared units

$$v_{229} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0991}] \cdot [\mathrm{s\_1399}] - \frac{[\mathrm{s\_1138}] \cdot [\mathrm{s\_1372}]}{\mathrm{Keq}} \right)}{\mathrm{Km0991} \cdot \mathrm{Km1399}}}{\left(1 + \frac{[\mathrm{s\_0991}]}{\mathrm{Km0991}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1399}]}{\mathrm{Km1399}}\right) + \left(1 + \frac{[\mathrm{s\_1138}]}{\mathrm{Km1138}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1372}]}{\mathrm{Km1372}}\right) - 1} \tag{459}$$

Table 920: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120779209 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.004	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0991		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1399		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1138		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1372		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.230 Reaction r_0934

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Malonyl-CoA methyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1552} + \mathrm{s\_1217} \xrightleftharpoons{\mathrm{e\_0277,\ s\_1552,\ s\_1217,\ s\_1551,\ s\_1218}} \mathrm{s\_1551} + \mathrm{s\_1218} \qquad (460)$$

Reactants

Table 921: Properties of each reactant.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1217	Malonyl-CoA	

Modifiers

Table 922: Properties of each modifier.

Id	Name	SBO
e_0277	bioC	0000460
s_1552	S-Adenosyl-L-methionine	
s_1217	Malonyl-CoA	
s_1551	S-Adenosyl-L-homocysteine	
s_1218	malonyl-CoA methyl ester	

Products

Table 923: Properties of each product.

Id	Name	SBO
s_1551	S-Adenosyl-L-homocysteine	

Id	Name	SBO
s_1218	malonyl-CoA methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{230} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1552}] \cdot [\text{s\_1217}] - \frac{[\text{s\_1551}] \cdot [\text{s\_1218}]}{\text{Keq}} \right)}{\text{Km1552} \cdot \text{Km1217}}}{\left(1 + \frac{[\text{s\_1552}]}{\text{Km1552}}\right) \cdot \left(1 + \frac{[\text{s\_1217}]}{\text{Km1217}}\right) + \left(1 + \frac{[\text{s\_1551}]}{\text{Km1551}}\right) \cdot \left(1 + \frac{[\text{s\_1218}]}{\text{Km1218}}\right) - 1} \tag{461}$$

Table 924: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$3.87846855038663 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1552		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1217		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1551		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1218		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.231 Reaction r_0935

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name Malonyl-CoA-ACP transacylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0397} + \text{s\_1217} \xrightleftharpoons{\text{e\_0375, e\_0373, s\_0397, s\_1217, s\_0555, s\_1216}} \text{s\_0555} + \text{s\_1216} \tag{462}$$

Reactants

Table 925: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	
s_1217	Malonyl-CoA	

Modifiers

Table 926: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0373	fabD	0000460
s_0397	acyl carrier protein	
s_1217	Malonyl-CoA	
s_0555	Coenzyme A	
s_1216	Malonyl-[acyl-carrier protein]	

Products

Table 927: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_1216	Malonyl-[acyl-carrier protein]	

Kinetic Law

Derived unit contains undeclared units

$$v_{231} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0397}] \cdot [\mathrm{s\_1217}] - \frac{[\mathrm{s\_0555}] \cdot [\mathrm{s\_1216}]}{\mathrm{Keq}} \right)}{\mathrm{Km0397} \cdot \mathrm{Km1217}}}{\left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1217}]}{\mathrm{Km1217}}\right) + \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1216}]}{\mathrm{Km1216}}\right) - 1} \tag{463}$$

Table 928: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	☑
Vmax		0000324	0.151	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0397		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1217		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0555		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1216		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.232 Reaction r_0950

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name methenyltetrahydrofolate cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0335} \xrightleftharpoons{\text{e\_0188, s\_0335, s\_0133}} \text{s\_0133} \tag{464}$$

Reactant

Table 929: Properties of each reactant.

Id	Name	SBO
s_0335	5,10-Methenyltetrahydrofolate	

Modifiers

Table 930: Properties of each modifier.

Id	Name	SBO
e_0188	folD	0000460
s_0335	5,10-Methenyltetrahydrofolate	
s_0133	10-Formyltetrahydrofolate	

Product

Table 931: Properties of each product.

Id	Name	SBO
s_0133	10-Formyltetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{232} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0335}] - \frac{[\text{s\_0133}]}{\text{Keq}} \right)}{\text{Km0335}}}{1 + \frac{[\text{s\_0335}]}{\text{Km0335}} + 1 + \frac{[\text{s\_0133}]}{\text{Km0133}} - 1} \tag{465}$$

Table 932: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.038	dimensionless	☑
Vmax		0000324	0.230	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0335		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0133		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.233 Reaction r_0951

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name methionine adenosyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_1141} \xrightleftharpoons{\mathrm{e\_0931,\ s\_0467,\ s\_1141,\ s\_1552,\ s\_1430,\ s\_0783}} \mathrm{s\_1552} + \mathrm{s\_1430} + \mathrm{s\_0783} \tag{466}$$

Reactants

Table 933: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1141	L-Methionine	

Modifiers

Table 934: Properties of each modifier.

Id	Name	SBO
e_0931	metK	0000460
s_0467	ATP	
s_1141	L-Methionine	
s_1552	S-Adenosyl-L-methionine	
s_1430	Phosphate	
s_0783	Diphosphate	

Products

Table 935: Properties of each product.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1430	Phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{233} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1141}] - \frac{[\mathrm{s\_1552}] \cdot [\mathrm{s\_1430}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1141}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1141}]}{\mathrm{Km1141}}\right) + \left(1 + \frac{[\mathrm{s\_1552}]}{\mathrm{Km1552}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{467}$$

Table 936: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.24388027294171 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.003	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1141		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1552		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.234 Reaction r_0954

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name methionine synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0354} + \mathrm{s\_1112} \xrightleftharpoons{\mathrm{e\_1196,\ e\_1262,\ s\_0354,\ s\_1112,\ s\_1141,\ s\_0337}} \mathrm{s\_1141} + \mathrm{s\_0337} \tag{468}$$

Reactants

Table 937: Properties of each reactant.

Id	Name	SBO
s_0354	5-Methyltetrahydrofolate	
s_1112	L-Homocysteine	

Modifiers

Table 938: Properties of each modifier.

Id	Name	SBO
e_1196	metE	0000460
e_1262	metH	0000460
s_0354	5-Methyltetrahydrofolate	
s_1112	L-Homocysteine	
s_1141	L-Methionine	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 939: Properties of each product.

Id	Name	SBO
s_1141	L-Methionine	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{234} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0354}] \cdot [\mathrm{s\_1112}] - \frac{[\mathrm{s\_1141}] \cdot [\mathrm{s\_0337}]}{\mathrm{Keq}} \right)}{\mathrm{Km0354} \cdot \mathrm{Km1112}}}{\left(1 + \frac{[\mathrm{s\_0354}]}{\mathrm{Km0354}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1112}]}{\mathrm{Km1112}}\right) + \left(1 + \frac{[\mathrm{s\_1141}]}{\mathrm{Km1141}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0337}]}{\mathrm{Km0337}}\right) - 1} \tag{469}$$

Table 940: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.299	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0354		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1112		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1141		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0337		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.235 Reaction r_0957

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name methylenetetrahydrofolate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0336} + \mathrm{s\_1335} \xrightleftharpoons{\mathrm{e\_0188,\ s\_0336,\ s\_1335,\ s\_0335,\ s\_1336}} \mathrm{s\_0335} + \mathrm{s\_1336} \tag{470}$$

Reactants

Table 941: Properties of each reactant.

Id	Name	SBO
s_0336	5,10-Methylenetetrahydrofolate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 942: Properties of each modifier.

Id	Name	SBO
e_0188	folD	0000460
s_0336	5,10-Methylenetetrahydrofolate	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0335	5,10-Methenyltetrahydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 943: Properties of each product.

Id	Name	SBO
s_0335	5,10-Methenyltetrahydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{235} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0336}] \cdot [\text{s\_1335}] - \frac{[\text{s\_0335}] \cdot [\text{s\_1336}]}{\text{Keq}} \right)}{\text{Km0336} \cdot \text{Km1335}}}{\left(1 + \frac{[\text{s\_0336}]}{\text{Km0336}}\right) \cdot \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) + \left(1 + \frac{[\text{s\_0335}]}{\text{Km0335}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) - 1} \tag{471}$$

Table 944: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.038	dimensionless	☑
Vmax		0000324	0.536	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.236 Reaction r_0963

This is a reversible reaction of three reactants forming four products influenced by nine modifiers.

Name MoaD sulfuration (nadh, assumed)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1018} + \text{s\_1258} + \text{s\_1334} \xrightleftharpoons{\text{e\_0281, e\_0805, s\_1018, s\_1258, s\_1334, s\_0454, s\_1017, s\_1260, s\_1333}} \text{s\_0454} + \text{s\_101} \tag{472}$$

Reactants

Table 945: Properties of each reactant.

Id	Name	SBO
s_1018	IscS with bound sulfur	
s_1258	MoaD Protein with bound AMP	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 946: Properties of each modifier.

Id	Name	SBO
e_0281	moaD	0000460
e_0805	iscS	0000460
s_1018	IscS with bound sulfur	
s_1258	MoaD Protein with bound AMP	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0454	AMP	
s_1017	IscS sulfur acceptor protein	
s_1260	MoaD Protein with thiocarboxylate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 947: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1017	IscS sulfur acceptor protein	
s_1260	MoaD Protein with thiocarboxylate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{236} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1018}] \cdot [\mathrm{s\_1258}] \cdot [\mathrm{s\_1334}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_1017}] \cdot [\mathrm{s\_1260}] \cdot [\mathrm{s\_1333}]}{\mathrm{Keq}} \right)}{\mathrm{Km1018} \cdot \mathrm{Km1258} \cdot \mathrm{Km1334}}}{\left(1 + \frac{[\mathrm{s\_1018}]}{\mathrm{Km1018}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1258}]}{\mathrm{Km1258}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1017}]}{\mathrm{Km1017}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1260}]}{\mathrm{Km1260}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) -} \quad (473)$$

Table 948: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.75961662815825 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.003	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1018		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1258		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1334		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0454		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1017		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1260		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1333		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.237 Reaction r_0964

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name molybdenum cofactor synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1261} + \mathrm{s\_0420} \xrightleftharpoons{\mathrm{e\_0292},\ \mathrm{s\_1261},\ \mathrm{s\_0420},\ \mathrm{s\_0454},\ \mathrm{s\_0579},\ \mathrm{s\_1264}} \mathrm{s\_0454} + \mathrm{s\_0579} + \mathrm{s\_1264} \tag{474}$$

Reactants

Table 949: Properties of each reactant.

Id	Name	SBO
s_1261	Molybdate	
s_0420	adenylated molybdopterin	

Modifiers

Table 950: Properties of each modifier.

Id	Name	SBO
e_0292	moeA	0000460
s_1261	Molybdate	

Id	Name	SBO
s_0420	adenylated molybdopterin	
s_0454	AMP	
s_0579	Cu2+	
s_1264	molybdenum cofactor	

Products

Table 951: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0579	Cu2+	
s_1264	molybdenum cofactor	

Kinetic Law

Derived unit contains undeclared units

$$v_{237} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1261}] \cdot [\mathrm{s\_0420}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_0579}] \cdot [\mathrm{s\_1264}]}{\mathrm{Keq}} \right)}{\mathrm{Km1261} \cdot \mathrm{Km0420}}}{\left(1 + \frac{[\mathrm{s\_1261}]}{\mathrm{Km1261}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0420}]}{\mathrm{Km0420}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0579}]}{\mathrm{Km0579}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1264}]}{\mathrm{Km1264}}\right) - 1} \tag{475}$$

Table 952: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.71778914548703 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1261		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0420		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0454		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0579		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1264		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.238 Reaction r_0965

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name molybdopterin adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1265} \xrightleftharpoons{\text{e\_0006, s\_0467, s\_1265, s\_0420, s\_0783}} \text{s\_0420} + \text{s\_0783} \tag{476}$$

Reactants

Table 953: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1265	molybdopterin	

Modifiers

Table 954: Properties of each modifier.

Id	Name	SBO
e_0006	mog	0000460
s_0467	ATP	
s_1265	molybdopterin	
s_0420	adenylated molybdopterin	
s_0783	Diphosphate	

Products

Table 955: Properties of each product.

Id	Name	SBO
s_0420	adenylated molybdopterin	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{238} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1265}] - \frac{[\text{s\_0420}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1265}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1265}]}{\text{Km1265}}\right) + \left(1 + \frac{[\text{s\_0420}]}{\text{Km0420}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{477}$$

Table 956: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.37980831407913 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.73173163971078 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1265		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0420		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.239 Reaction r_0968

This is a reversible reaction of three reactants forming two products influenced by seven modifiers.

Name molybdopterin synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0585} + \text{s\_0579} + 2\,\text{s\_1260} \xrightleftharpoons{\text{e\_0281, e\_0282, s\_0585, s\_0579, s\_1260, s\_1259, s\_1265}} 2\,\text{s\_1259} + \text{s\_1265} \quad (478)$$

Reactants

Table 957: Properties of each reactant.

Id	Name	SBO
s_0585	cyclic pyranopterin monophosphate	
s_0579	Cu2+	
s_1260	MoaD Protein with thiocarboxylate	

Modifiers

Table 958: Properties of each modifier.

Id	Name	SBO
e_0281	moaD	0000460
e_0282	moaE	0000460
s_0585	cyclic pyranopterin monophosphate	

Id	Name	SBO
s_0579	Cu2+	
s_1260	MoaD Protein with thiocarboxylate	
s_1259	MoaD Protein with carboxylate	
s_1265	molybdopterin	

Products

Table 959: Properties of each product.

Id	Name	SBO
s_1259	MoaD Protein with carboxylate	
s_1265	molybdopterin	

Kinetic Law

Derived unit contains undeclared units

$$v_{239} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0585}] \cdot [\mathrm{s\_0579}] \cdot [\mathrm{s\_1260}]^2 - \frac{[\mathrm{s\_1259}]^2 \cdot [\mathrm{s\_1265}]}{\mathrm{Keq}} \right)}{\mathrm{Km0585} \cdot \mathrm{Km0579} \cdot \mathrm{Km1260}^2}}{\left(1 + \frac{[\mathrm{s\_0585}]}{\mathrm{Km0585}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0579}]}{\mathrm{Km0579}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1260}]}{\mathrm{Km1260}}\right)^2 + \left(1 + \frac{[\mathrm{s\_1259}]}{\mathrm{Km1259}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_1265}]}{\mathrm{Km1265}}\right) - 1} \tag{479}$$

Table 960: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.37980831407913 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.002	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	20.000	$\mathrm{mmol}^{-1} \cdot \mathrm{l}$	☑
Km0585		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0579		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1260		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1259		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1265		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.240 Reaction r_0969

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name molybdopterin synthase sulfurylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1259} \xrightleftharpoons{\text{e\_0291, s\_0467, s\_1259, s\_1258, s\_0783}} \text{s\_1258} + \text{s\_0783} \tag{480}$$

Reactants

Table 961: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1259	MoaD Protein with carboxylate	

Modifiers

Table 962: Properties of each modifier.

Id	Name	SBO
e_0291	moeB	0000460
s_0467	ATP	
s_1259	MoaD Protein with carboxylate	
s_1258	MoaD Protein with bound AMP	
s_0783	Diphosphate	

Products

Table 963: Properties of each product.

Id	Name	SBO
s_1258	MoaD Protein with bound AMP	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{240} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1259}] - \frac{[\text{s\_1258}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1259}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1259}]}{\text{Km1259}}\right) + \left(1 + \frac{[\text{s\_1258}]}{\text{Km1258}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{481}$$

Table 964: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.75961662815825 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$9.46346327942155 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1259		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1258		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.241 Reaction r_0970

This is a reversible reaction of one reactant forming two products influenced by seven modifiers.

Name murein crosslinking transpeptidase 1A:(A2pm->D-ala) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1725} \xrightleftharpoons{\text{e\_0036, e\_1029, e\_0221, e\_0065, s\_1725, s\_0600, s\_1719}} \text{s\_0600} + \text{s\_1719} \qquad (482)$$

Reactant

Table 965: Properties of each reactant.

Id	Name	SBO
s_1725	two linked disaccharide pentapeptide murein units (uncrosslinked, middle of chain)	

Modifiers

Table 966: Properties of each modifier.

Id	Name
e_0036	ftsI
e_1029	mrcA
e_0221	mrdA
e_0065	mrcB
s_1725	two linked disaccharide pentapeptide murein units (uncrosslinked, middle of chain)
s_0600	D-Alanine
s_1719	two disaccharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of cl

Products

Table 967: Properties of each product.

Id	Name
s_0600	D-Alanine
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of cl

Kinetic Law

Derived unit contains undeclared units

$$v_{241} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1725}] - \frac{[\mathrm{s\_0600}] \cdot [\mathrm{s\_1719}]}{\mathrm{Keq}} \right)}{\mathrm{Km1725}}}{1 + \frac{[\mathrm{s\_1725}]}{\mathrm{Km1725}} + \left(1 + \frac{[\mathrm{s\_0600}]}{\mathrm{Km0600}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1719}]}{\mathrm{Km1719}}\right) - 1} \tag{483}$$

Table 968: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	☑
Vmax		0000324	0.019	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1725		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0600		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1719		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.242 Reaction r_0996

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name N-acetyl-g-glutamyl-phosphate reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1304} + \mathrm{s\_1336} \xrightleftharpoons{\mathrm{e\_1242,\ s\_1304,\ s\_1336,\ s\_1303,\ s\_1335,\ s\_1430}} \mathrm{s\_1303} + \mathrm{s\_1335} + \mathrm{s\_1430} \tag{484}$$

Reactants

Table 969: Properties of each reactant.

Id	Name	SBO
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 970: Properties of each modifier.

Id	Name	SBO
e_1242	argC	0000460
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Products

Table 971: Properties of each product.

Id	Name	SBO
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{242} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1304}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_1303}] \cdot [\mathrm{s\_1335}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km1304} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_1304}]}{\mathrm{Km1304}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_1303}]}{\mathrm{Km1303}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{485}$$

Table 972: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.901	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1304		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1303		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.243 Reaction r_0999

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name N-acetylglutamate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0395} + \mathrm{s\_1095} \xrightleftharpoons{\mathrm{e\_0893,\ s\_0395,\ s\_1095,\ s\_1302,\ s\_0555}} \mathrm{s\_1302} + \mathrm{s\_0555} \tag{486}$$

Reactants

Table 973: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1095	L-Glutamate	

Modifiers

Table 974: Properties of each modifier.

Id	Name	SBO
e_0893	argA	0000460
s_0395	Acetyl-CoA	
s_1095	L-Glutamate	
s_1302	N-Acetyl-L-glutamate	
s_0555	Coenzyme A	

Products

Table 975: Properties of each product.

Id	Name	SBO
s_1302	N-Acetyl-L-glutamate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{243} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0395}] \cdot [\text{s\_1095}] - \frac{[\text{s\_1302}] \cdot [\text{s\_0555}]}{\text{Keq}} \right)}{\text{Km0395} \cdot \text{Km1095}}}{\left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) + \left(1 + \frac{[\text{s\_1302}]}{\text{Km1302}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) - 1} \tag{487}$$

Table 976: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.574	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1302		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.244 Reaction r_1006

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name NAD kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1333} \xrightleftharpoons{\text{e\_0828, s\_0467, s\_1333, s\_0421, s\_1335}} \text{s\_0421} + \text{s\_1335} \tag{488}$$

Reactants

Table 977: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 978: Properties of each modifier.

Id	Name	SBO
e_0828	ppnK	0000460
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	
s_0421	ADP	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 979: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{244} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1333}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_1335}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1333}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) - 1} \tag{489}$$

Table 980: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.1916980210075 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$8.6683772294105 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1333		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.245 Reaction r_1008

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name NAD synthase (nh3)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0732} + \mathrm{s\_0451} \xrightleftharpoons{\mathrm{e\_0554},\ \mathrm{s\_0467},\ \mathrm{s\_0732},\ \mathrm{s\_0451},\ \mathrm{s\_0454},\ \mathrm{s\_1333},\ \mathrm{s\_0783}} \mathrm{s\_0454} + \mathrm{s\_1333} + \mathrm{s\_0783} \quad (490)$$

Reactants

Table 981: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0732	Deamino-NAD+	
s_0451	Ammonium	

Modifiers

Table 982: Properties of each modifier.

Id	Name	SBO
e_0554	nadE	0000460
s_0467	ATP	
s_0732	Deamino-NAD+	
s_0451	Ammonium	
s_0454	AMP	
s_1333	Nicotinamide adenine dinucleotide	
s_0783	Diphosphate	

Products

Table 983: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1333	Nicotinamide adenine dinucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{245} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0732}] \cdot [\text{s\_0451}] - \frac{[\text{s\_0454}] \cdot [\text{s\_1333}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0732} \cdot \text{Km0451}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0732}]}{\text{Km0732}}\right) \cdot \left(1 + \frac{[\text{s\_0451}]}{\text{Km0451}}\right) + \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{491}$$

Table 984: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120476312 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.009	$\text{mmol} \cdot 1^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0732		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0451		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0454		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km1333		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑

6.246 Reaction r_1019

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name nicotinate-nucleotide adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1340} \xrightleftharpoons{\text{e\_0223, s\_0467, s\_1340, s\_0732, s\_0783}} \text{s\_0732} + \text{s\_0783} \tag{492}$$

Reactants

Table 985: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1340	Nicotinate D-ribonucleotide	

Modifiers

Table 986: Properties of each modifier.

Id	Name	SBO
e_0223	nadD	0000460
s_0467	ATP	
s_1340	Nicotinate D-ribonucleotide	
s_0732	Deamino-NAD+	
s_0783	Diphosphate	

Products

Table 987: Properties of each product.

Id	Name	SBO
s_0732	Deamino-NAD+	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{246} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1340}] - \frac{[\mathrm{s\_0732}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1340}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1340}]}{\mathrm{Km1340}}\right) + \left(1 + \frac{[\mathrm{s\_0732}]}{\mathrm{Km0732}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{493}$$

Table 988: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120469206 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.004	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1340		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0732		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.247 Reaction r_1021

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name nicotinate-nucleotide diphosphorylase (carboxylating)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0360} + \mathrm{s\_1537} \xrightleftharpoons{\mathrm{e\_0048},\ \mathrm{s\_0360},\ \mathrm{s\_1537},\ \mathrm{s\_0543},\ \mathrm{s\_1340},\ \mathrm{s\_0783}} \mathrm{s\_0543} + \mathrm{s\_1340} + \mathrm{s\_0783} \tag{494}$$

Reactants

Table 989: Properties of each reactant.

Id	Name	SBO
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_1537	Quinolinate	

Modifiers

Table 990: Properties of each modifier.

Id	Name	SBO
e_0048	nadC	0000460
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_1537	Quinolinate	
s_0543	CO2	
s_1340	Nicotinate D-ribonucleotide	
s_0783	Diphosphate	

Products

Table 991: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1340	Nicotinate D-ribonucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{247} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0360}] \cdot [\text{s\_1537}] - \frac{[\text{s\_0543}] \cdot [\text{s\_1340}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0360} \cdot \text{Km1537}}}{\left(1 + \frac{[\text{s\_0360}]}{\text{Km0360}}\right) \cdot \left(1 + \frac{[\text{s\_1537}]}{\text{Km1537}}\right) + \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_1340}]}{\text{Km1340}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{495}$$

Table 992: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120467916 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.007	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0360		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1537		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1340		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.248 Reaction r_1039

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:CDP)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0510} \xrightleftharpoons{\text{e\_0799, e\_0167, s\_0467, s\_0510, s\_0421, s\_0575}} \text{s\_0421} + \text{s\_0575} \tag{496}$$

Reactants

Table 993: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0510	CDP	

Modifiers

Table 994: Properties of each modifier.

Id	Name	SBO
e_0799	ndk	0000460
e_0167	adk	0000460
s_0467	ATP	
s_0510	CDP	
s_0421	ADP	
s_0575	CTP	

Products

Table 995: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0575	CTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{248} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0510}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0575}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0510}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0510}]}{\mathrm{Km0510}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0575}]}{\mathrm{Km0575}}\right) - 1} \tag{497}$$

Table 996: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.025	dimensionless	☑
Vmax		0000324	0.351	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0510		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0575		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.249 Reaction r_1043

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:dTDP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0795} \xrightleftharpoons{\mathrm{e\_0799,\ e\_0167,\ s\_0467,\ s\_0795,\ s\_0421,\ s\_0805}} \mathrm{s\_0421} + \mathrm{s\_0805} \qquad (498)$$

Reactants

Table 997: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0795	dTDP	

Modifiers

Table 998: Properties of each modifier.

Id	Name	SBO
e_0799	ndk	0000460
e_0167	adk	0000460
s_0467	ATP	
s_0795	dTDP	
s_0421	ADP	
s_0805	dTTP	

Products

Table 999: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0805	dTTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{249} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0795}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0805}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0795}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0795}]}{\text{Km0795}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0805}]}{\text{Km0805}}\right) - 1} \tag{499}$$

Table 1000: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.051	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0795		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0805		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.250 Reaction r_1045

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:GDP)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0896} \xrightleftharpoons{\text{e\_0799, e\_0167, s\_0467, s\_0896, s\_0421, s\_0945}} \text{s\_0421} + \text{s\_0945} \tag{500}$$

Reactants

Table 1001: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0896	GDP	

Modifiers

Table 1002: Properties of each modifier.

Id	Name	SBO
e_0799	ndk	0000460
e_0167	adk	0000460
s_0467	ATP	
s_0896	GDP	
s_0421	ADP	
s_0945	GTP	

Products

Table 1003: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0945	GTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{250} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0896}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0945}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0896}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0896}]}{\mathrm{Km0896}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0945}]}{\mathrm{Km0945}}\right) - 1} \tag{501}$$

Table 1004: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.109	dimensionless	☑
Vmax		0000324	1.524	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0896		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0945		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.251 Reaction r_1046

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:UDP)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_1733} \xrightleftharpoons{\mathrm{e\_0799},\ \mathrm{e\_0167},\ \mathrm{s\_0467},\ \mathrm{s\_1733},\ \mathrm{s\_0421},\ \mathrm{s\_1792}} \mathrm{s\_0421} + \mathrm{s\_1792} \qquad (502)$$

Reactants

Table 1005: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1733	UDP	

Modifiers

Table 1006: Properties of each modifier.

Id	Name	SBO
e_0799	ndk	0000460
e_0167	adk	0000460
s_0467	ATP	
s_1733	UDP	
s_0421	ADP	
s_1792	UTP	

Products

Table 1007: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1792	UTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{251} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1733}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1792}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1733}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1733}]}{\text{Km1733}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1792}]}{\text{Km1792}}\right) - 1} \tag{503}$$

Table 1008: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.059	dimensionless	☑
Vmax		0000324	0.825	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1733		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1792		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.252 Reaction r_1047

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name nucleoside-triphosphatase (ATP)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} \xrightleftharpoons{\text{e\_1313, e\_0225, s\_0467, s\_0421, s\_1430}} \text{s\_0421} + \text{s\_1430} \tag{504}$$

Reactant

Table 1009: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	

Modifiers

Table 1010: Properties of each modifier.

Id	Name	SBO
e_1313	rsgA	0000460
e_0225	hscC	0000460
s_0467	ATP	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 1011: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{252} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467}}}{1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}} + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{505}$$

Table 1012: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			3.150	dimensionless	☑
Vmax		0000324	31.500	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.253 Reaction r_1054

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name O-Phospho-4-hydroxy-L-threonine:2-oxoglutarate aminotransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1095} + \text{s\_0231} \xrightleftharpoons{\text{e\_0326, s\_1095, s\_0231, s\_0233, s\_1362}} \text{s\_0233} + \text{s\_1362} \qquad (506)$$

Reactants

Table 1013: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	

Modifiers

Table 1014: Properties of each modifier.

Id	Name	SBO
e_0326	serC	0000460
s_1095	L-Glutamate	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	
s_0233	2-Oxoglutarate	
s_1362	O-Phospho-4-hydroxy-L-threonine	

Products

Table 1015: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1362	O-Phospho-4-hydroxy-L-threonine	

Kinetic Law

Derived unit contains undeclared units

$$v_{253} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1095}] \cdot [\text{s\_0231}] - \frac{[\text{s\_0233}] \cdot [\text{s\_1362}]}{\text{Keq}} \right)}{\text{Km1095} \cdot \text{Km0231}}}{\left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) \cdot \left(1 + \frac{[\text{s\_0231}]}{\text{Km0231}}\right) + \left(1 + \frac{[\text{s\_0233}]}{\text{Km0233}}\right) \cdot \left(1 + \frac{[\text{s\_1362}]}{\text{Km1362}}\right) - 1} \tag{507}$$

Table 1016: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244111493 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0231		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1362		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.254 Reaction r_1057

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name O-succinylhomoserine lyase (L-cysteine)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1083} + \text{s\_1367} \xrightleftharpoons{\text{e\_1232, s\_1083, s\_1367, s\_1082, s\_1595}} \text{s\_1082} + \text{s\_1595} \tag{508}$$

Reactants

Table 1017: Properties of each reactant.

Id	Name	SBO
s_1083	L-Cysteine	
s_1367	O-Succinyl-L-homoserine	

Modifiers

Table 1018: Properties of each modifier.

Id	Name	SBO
e_1232	metB	0000460

Id	Name	SBO
s_1083	L-Cysteine	
s_1367	O-Succinyl-L-homoserine	
s_1082	L-Cystathionine	
s_1595	Succinate	

Products

Table 1019: Properties of each product.

Id	Name	SBO
s_1082	L-Cystathionine	
s_1595	Succinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{254} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1083}] \cdot [\text{s\_1367}] - \frac{[\text{s\_1082}] \cdot [\text{s\_1595}]}{\text{Keq}} \right)}{\text{Km1083} \cdot \text{Km1367}}}{\left(1 + \frac{[\text{s\_1083}]}{\text{Km1083}}\right) \cdot \left(1 + \frac{[\text{s\_1367}]}{\text{Km1367}}\right) + \left(1 + \frac{[\text{s\_1082}]}{\text{Km1082}}\right) \cdot \left(1 + \frac{[\text{s\_1595}]}{\text{Km1595}}\right) - 1} \tag{509}$$

Table 1020: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	☑
Vmax		0000324	0.298	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1083		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1367		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1082		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1595		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.255 Reaction r_1063

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Octaprenyl pyrophosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0826} + 5\,\text{s\_1028} \xrightleftharpoons{\text{e\_0990, s\_0826, s\_1028, s\_0435, s\_0783}} \text{s\_0435} + 5\,\text{s\_0783} \tag{510}$$

Reactants

Table 1021: Properties of each reactant.

Id	Name	SBO
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 1022: Properties of each modifier.

Id	Name	SBO
e_0990	ispB	0000460
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0435	all-trans-Octaprenyl diphosphate	
s_0783	Diphosphate	

Products

Table 1023: Properties of each product.

Id	Name	SBO
s_0435	all-trans-Octaprenyl diphosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{255} = \frac{\dfrac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0826}] \cdot [\text{s\_1028}]^5 - \frac{[\text{s\_0435}] \cdot [\text{s\_0783}]^5}{\text{Keq}} \right)}{\text{Km0826} \cdot \text{Km1028}^5}}{\left(1 + \frac{[\text{s\_0826}]}{\text{Km0826}}\right) \cdot \left(1 + \frac{[\text{s\_1028}]}{\text{Km1028}}\right)^5 + \left(1 + \frac{[\text{s\_0435}]}{\text{Km0435}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right)^5 - 1} \tag{511}$$

Table 1024: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229362 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.008	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0826		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1028		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0435		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.256 Reaction r_1064

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name Octaprenyl-hydroxybenzoate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0283} \xrightleftharpoons{\mathrm{e\_0727},\ \mathrm{e\_1200},\ \mathrm{s\_0283},\ \mathrm{s\_0229},\ \mathrm{s\_0543}} \mathrm{s\_0229} + \mathrm{s\_0543} \qquad (512)$$

Reactant

Table 1025: Properties of each reactant.

Id	Name	SBO
s_0283	3-Octaprenyl-4-hydroxybenzoate	

Modifiers

Table 1026: Properties of each modifier.

Id	Name	SBO
e_0727	ubiX	0000460
e_1200	ubiD	0000460
s_0283	3-Octaprenyl-4-hydroxybenzoate	
s_0229	2-Octaprenylphenol	
s_0543	CO2	

Products

Table 1027: Properties of each product.

Id	Name	SBO
s_0229	2-Octaprenylphenol	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{256} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0283}] - \frac{[\text{s\_0229}] \cdot [\text{s\_0543}]}{\text{Keq}} \right)}{\text{Km0283}}}{1 + \frac{[\text{s\_0283}]}{\text{Km0283}} + \left(1 + \frac{[\text{s\_0229}]}{\text{Km0229}}\right) \cdot \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) - 1} \tag{513}$$

Table 1028: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.08892317229363 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0283		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0229		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.257 Reaction r_1065

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name ornithine carbamoyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0502} + \text{s\_1391} \xrightleftharpoons{\text{e\_1341, e\_0103, s\_0502, s\_1391, s\_1081, s\_1430}} \text{s\_1081} + \text{s\_1430} \tag{514}$$

Reactants

Table 1029: Properties of each reactant.

Id	Name	SBO
s_0502	Carbamoyl phosphate	
s_1391	Ornithine	

Modifiers

Table 1030: Properties of each modifier.

Id	Name	SBO
e_1341	argI	0000460
e_0103	argF	0000460
s_0502	Carbamoyl phosphate	
s_1391	Ornithine	
s_1081	L-Citrulline	
s_1430	Phosphate	

Products

Table 1031: Properties of each product.

Id	Name	SBO
s_1081	L-Citrulline	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{257} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0502}] \cdot [\text{s\_1391}] - \frac{[\text{s\_1081}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0502} \cdot \text{Km1391}}}{\left(1 + \frac{[\text{s\_0502}]}{\text{Km0502}}\right) \cdot \left(1 + \frac{[\text{s\_1391}]}{\text{Km1391}}\right) + \left(1 + \frac{[\text{s\_1081}]}{\text{Km1081}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{515}$$

Table 1032: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.574	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0502		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1391		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1081		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.258 Reaction r_1067

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name orotate phosphoribosyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1394} + \mathrm{s\_0360} \xrightleftharpoons{\mathrm{e\_1129},\ \mathrm{s\_1394},\ \mathrm{s\_0360},\ \mathrm{s\_1397},\ \mathrm{s\_0783}} \mathrm{s\_1397} + \mathrm{s\_0783} \tag{516}$$

Reactants

Table 1033: Properties of each reactant.

Id	Name	SBO
s_1394	Orotate	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 1034: Properties of each modifier.

Id	Name	SBO
e_1129	pyrE	0000460
s_1394	Orotate	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_1397	Orotidine 5'-phosphate	
s_0783	Diphosphate	

Products

Table 1035: Properties of each product.

Id	Name	SBO
s_1397	Orotidine 5'-phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{258} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1394}] \cdot [\text{s\_0360}] - \frac{[\text{s\_1397}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km1394} \cdot \text{Km0360}}}{\left(1 + \frac{[\text{s\_1394}]}{\text{Km1394}}\right) \cdot \left(1 + \frac{[\text{s\_0360}]}{\text{Km0360}}\right) + \left(1 + \frac{[\text{s\_1397}]}{\text{Km1397}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{517}$$

Table 1036: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	☑
Vmax		0000324	0.641	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1394		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0360		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1397		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.259 Reaction r_1068

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name orotidine-5'-phosphate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1397} \xrightleftharpoons{\text{e\_0435, s\_1397, s\_0543, s\_1762}} \text{s\_0543} + \text{s\_1762} \tag{518}$$

Reactant

Table 1037: Properties of each reactant.

Id	Name	SBO
s_1397	Orotidine 5'-phosphate	

Modifiers

Table 1038: Properties of each modifier.

Id	Name	SBO
e_0435	pyrF	0000460
s_1397	Orotidine 5'-phosphate	
s_0543	CO2	
s_1762	UMP	

Products

Table 1039: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1762	UMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{259} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1397}] - \frac{[\text{s\_0543}] \cdot [\text{s\_1762}]}{\text{Keq}} \right)}{\text{Km1397}}}{1 + \frac{[\text{s\_1397}]}{\text{Km1397}} + \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_1762}]}{\text{Km1762}}\right) - 1} \tag{519}$$

Table 1040: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	☑
Vmax		0000324	0.458	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1397		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1762		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.260 Reaction r_1074

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name pantetheine-phosphate adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1413} \xrightleftharpoons{\text{e\_1126, s\_0467, s\_1413, s\_0754, s\_0783}} \text{s\_0754} + \text{s\_0783} \tag{520}$$

Reactants

Table 1041: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1413	Pantetheine 4'-phosphate	

Modifiers

Table 1042: Properties of each modifier.

Id	Name	SBO
e_1126	coaD	0000460
s_0467	ATP	
s_1413	Pantetheine 4'-phosphate	
s_0754	Dephospho-CoA	
s_0783	Diphosphate	

Products

Table 1043: Properties of each product.

Id	Name	SBO
s_0754	Dephospho-CoA	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{260} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1413}] - \frac{[\text{s\_0754}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1413}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1413}]}{\text{Km1413}}\right) + \left(1 + \frac{[\text{s\_0754}]}{\text{Km0754}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{521}$$

Table 1044: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1413		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0754		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.261 Reaction r_1075

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name pantothenate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0033} \xrightleftharpoons{\text{e\_1249, s\_0467, s\_0033, s\_0599, s\_0421}} \text{s\_0599} + \text{s\_0421} \tag{522}$$

Reactants

Table 1045: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0033	(R)-Pantothenate	

Modifiers

Table 1046: Properties of each modifier.

Id	Name	SBO
e_1249	coaA	0000460

Id	Name	SBO
s_0467	ATP	
s_0033	(R)-Pantothenate	
s_0599	D-4'-Phosphopantothenate	
s_0421	ADP	

Products

Table 1047: Properties of each product.

Id	Name	SBO
s_0599	D-4'-Phosphopantothenate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{261} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0033}] - \frac{[\mathrm{s\_0599}] \cdot [\mathrm{s\_0421}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0033}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0033}]}{\mathrm{Km0033}}\right) + \left(1 + \frac{[\mathrm{s\_0599}]}{\mathrm{Km0599}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) - 1} \tag{523}$$

Table 1048: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0033		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0599		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.262 Reaction r_1076

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name pantothenate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0470} + \text{s\_0467} + \text{s\_0032} \xrightleftharpoons{\text{e\_0062, s\_0470, s\_0467, s\_0032, s\_0454, s\_0033, s\_0783}} \text{s\_0454} + \text{s\_0033} + \text{s\_0783} \quad (524)$$

Reactants

Table 1049: Properties of each reactant.

Id	Name	SBO
s_0470	beta-Alanine	
s_0467	ATP	
s_0032	(R)-Pantoate	

Modifiers

Table 1050: Properties of each modifier.

Id	Name	SBO
e_0062	panC	0000460
s_0470	beta-Alanine	
s_0467	ATP	
s_0032	(R)-Pantoate	
s_0454	AMP	
s_0033	(R)-Pantothenate	
s_0783	Diphosphate	

Products

Table 1051: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0033	(R)-Pantothenate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{262} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0470}] \cdot [\text{s\_0467}] \cdot [\text{s\_0032}] - \frac{[\text{s\_0454}] \cdot [\text{s\_0033}] \cdot [\text{s\_0783}]}{\text{Keq}} \right)}{\text{Km0470} \cdot \text{Km0467} \cdot \text{Km0032}}}{\left(1 + \frac{[\text{s\_0470}]}{\text{Km0470}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0032}]}{\text{Km0032}}\right) + \left(1 + \frac{[\text{s\_0454}]}{\text{Km0454}}\right) \cdot \left(1 + \frac{[\text{s\_0033}]}{\text{Km0033}}\right) \cdot \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) - 1} \tag{525}$$

Table 1052: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388884133 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0470		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0032		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0033		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.263 Reaction r_1081

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name phenylalanine transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1095} + \text{s\_1429} \xrightleftharpoons{\text{e\_1167, e\_1276, e\_0332, s\_1095, s\_1429, s\_0233, s\_1151}} \text{s\_0233} + \text{s\_1151} \tag{526}$$

Reactants

Table 1053: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1429	Phenylpyruvate	

Modifiers

Table 1054: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
e_1276	tyrB	0000460
e_0332	aspC	0000460
s_1095	L-Glutamate	
s_1429	Phenylpyruvate	
s_0233	2-Oxoglutarate	
s_1151	L-Phenylalanine	

Products

Table 1055: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1151	L-Phenylalanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{263} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1095}] \cdot [\mathrm{s\_1429}] - \frac{[\mathrm{s\_0233}] \cdot [\mathrm{s\_1151}]}{\mathrm{Keq}} \right)}{\mathrm{Km1095} \cdot \mathrm{Km1429}}}{\left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1429}]}{\mathrm{Km1429}}\right) + \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1151}]}{\mathrm{Km1151}}\right) - 1} \tag{527}$$

Table 1056: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.026	dimensionless	☑
Vmax		0000324	0.359	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1095		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1429		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0233		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1151		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.264 Reaction r_1123

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Phosphatidylserine decarboxylase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1477} \xrightleftharpoons{\text{e\_1312, s\_1477, s\_0543, s\_1437}} \text{s\_0543} + \text{s\_1437} \tag{528}$$

Reactant

Table 1057: Properties of each reactant.

Id	Name	SBO
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	

Modifiers

Table 1058: Properties of each modifier.

Id	Name	SBO
e_1312	psd	0000460
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	
s_0543	CO2	
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)	

Products

Table 1059: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{264} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1477}] - \frac{[\text{s\_0543}] \cdot [\text{s\_1437}]}{\text{Keq}} \right)}{\text{Km1477}}}{1 + \frac{[\text{s\_1477}]}{\text{Km1477}} + \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_1437}]}{\text{Km1437}}\right) - 1} \tag{529}$$

Table 1060: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	☑
Vmax		0000324	0.088	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1477		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1437		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.265 Reaction r_1124

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Phosphatidylserine decarboxylase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1476} \xrightleftharpoons{\text{e\_1312, s\_1476, s\_0543, s\_1435}} \text{s\_0543} + \text{s\_1435} \tag{530}$$

Reactant

Table 1061: Properties of each reactant.

Id	Name	SBO
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	

Modifiers

Table 1062: Properties of each modifier.

Id	Name	SBO
e_1312	psd	0000460
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	
s_0543	CO2	

Id	Name	SBO
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)	

Products

Table 1063: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)	

Kinetic Law

Derived unit contains undeclared units

$$v_{265} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1476}] - \frac{[\mathrm{s\_0543}] \cdot [\mathrm{s\_1435}]}{\mathrm{Keq}} \right)}{\mathrm{Km1476}}}{1 + \frac{[\mathrm{s\_1476}]}{\mathrm{Km1476}} + \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1435}]}{\mathrm{Km1435}}\right) - 1} \tag{531}$$

Table 1064: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	☑
Vmax		0000324	0.104	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1476		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0543		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1435		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.266 Reaction r_1130

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Phosphatidylserine syntase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0513} + \mathrm{s\_1170} \xrightleftharpoons{\mathrm{e\_0823,\ s\_0513,\ s\_1170,\ s\_0539,\ s\_1477}} \mathrm{s\_0539} + \mathrm{s\_1477} \tag{532}$$

Reactants

Table 1065: Properties of each reactant.

Id	Name	SBO
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_1170	L-Serine	

Modifiers

Table 1066: Properties of each modifier.

Id	Name	SBO
e_0823	pssA	0000460
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_1170	L-Serine	
s_0539	CMP	
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	

Products

Table 1067: Properties of each product.

Id	Name	SBO
s_0539	CMP	
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{266} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0513}] \cdot [\mathrm{s\_1170}] - \frac{[\mathrm{s\_0539}] \cdot [\mathrm{s\_1477}]}{\mathrm{Keq}} \right)}{\mathrm{Km0513} \cdot \mathrm{Km1170}}}{\left(1 + \frac{[\mathrm{s\_0513}]}{\mathrm{Km0513}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1170}]}{\mathrm{Km1170}}\right) + \left(1 + \frac{[\mathrm{s\_0539}]}{\mathrm{Km0539}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1477}]}{\mathrm{Km1477}}\right) - 1} \tag{533}$$

Table 1068: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	☑
Vmax		0000324	0.124	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0513		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1170		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0539		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1477		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.267 Reaction r_1131

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Phosphatidylserine syntase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0512} + \mathrm{s\_1170} \xrightleftharpoons{\mathrm{e\_0823,\ s\_0512,\ s\_1170,\ s\_0539,\ s\_1476}} \mathrm{s\_0539} + \mathrm{s\_1476} \tag{534}$$

Reactants

Table 1069: Properties of each reactant.

Id	Name	SBO
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	
s_1170	L-Serine	

Modifiers

Table 1070: Properties of each modifier.

Id	Name	SBO
e_0823	pssA	0000460
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	
s_1170	L-Serine	
s_0539	CMP	
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	

Products

Table 1071: Properties of each product.

Id	Name	SBO
s_0539	CMP	
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	

Kinetic Law

Derived unit contains undeclared units

$$v_{267} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0512}] \cdot [\text{s\_1170}] - \frac{[\text{s\_0539}] \cdot [\text{s\_1476}]}{\text{Keq}} \right)}{\text{Km0512} \cdot \text{Km1170}}}{\left(1 + \frac{[\text{s\_0512}]}{\text{Km0512}}\right) \cdot \left(1 + \frac{[\text{s\_1170}]}{\text{Km1170}}\right) + \left(1 + \frac{[\text{s\_0539}]}{\text{Km0539}}\right) \cdot \left(1 + \frac{[\text{s\_1476}]}{\text{Km1476}}\right) - 1} \tag{535}$$

Table 1072: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	☑
Vmax		0000324	0.146	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0512		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1170		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0539		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1476		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.268 Reaction r_1134

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name phospho-L-serine phosphatase (periplasmic)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1364} \xrightleftharpoons{\text{e\_1277, e\_1369, s\_1364, s\_1430, s\_1170}} \text{s\_1430} + \text{s\_1170} \tag{536}$$

Reactant

Table 1073: Properties of each reactant.

Id	Name	SBO
s_1364	O-Phospho-L-serine	

Modifiers

Table 1074: Properties of each modifier.

Id	Name	SBO
e_1277	aphA	0000460
e_1369	serB	0000460
s_1364	O-Phospho-L-serine	
s_1430	Phosphate	
s_1170	L-Serine	

Products

Table 1075: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1170	L-Serine	

Kinetic Law

Derived unit contains undeclared units

$$v_{268} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1364}] - \frac{[\mathrm{s\_1430}] \cdot [\mathrm{s\_1170}]}{\mathrm{Keq}} \right)}{\mathrm{Km1364}}}{1 + \frac{[\mathrm{s\_1364}]}{\mathrm{Km1364}} + \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1170}]}{\mathrm{Km1170}}\right) - 1} \tag{537}$$

Table 1076: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.147	dimensionless	☑
Vmax		0000324	1.469	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1364		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1170		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.269 Reaction r_1137

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phospho-N-acetylmuramoyl-pentapeptide-transferase (meso-2,6-diaminopimelate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1768} + \text{s\_1755} \xrightleftharpoons{\text{e\_0039, s\_1768, s\_1755, s\_1777, s\_1762}} \text{s\_1777} + \text{s\_1762} \qquad (538)$$

Reactants

Table 1077: Properties of each reactant.

Id	Name	SBO
s_1768	Undecaprenyl phosphate	
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	

Modifiers

Table 1078: Properties of each modifier.

Id	Name
e_0039	mraY
s_1768	Undecaprenyl phosphate
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-
s_1762	UMP

Products

Table 1079: Properties of each product.

Id	Name
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-
s_1762	UMP

Kinetic Law

Derived unit contains undeclared units

$$v_{269} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1768}] \cdot [\text{s\_1755}] - \frac{[\text{s\_1777}] \cdot [\text{s\_1762}]}{\text{Keq}} \right)}{\text{Km1768} \cdot \text{Km1755}}}{\left(1 + \frac{[\text{s\_1768}]}{\text{Km1768}}\right) \cdot \left(1 + \frac{[\text{s\_1755}]}{\text{Km1755}}\right) + \left(1 + \frac{[\text{s\_1777}]}{\text{Km1777}}\right) \cdot \left(1 + \frac{[\text{s\_1762}]}{\text{Km1762}}\right) - 1} \tag{539}$$

Table 1080: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.054	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1768		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1755		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1777		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1762		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.270 Reaction r_1139

This is a reversible reaction of two reactants forming three products influenced by eight modifiers.

Name phosphoadenylyl-sulfate reductase (thioredoxin)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0252} + \text{s\_1544} \xrightleftharpoons{\text{e\_0871, e\_1172, e\_0822, s\_0252, s\_1544, s\_0411, s\_1612, s\_1406}} \text{s\_0411} + \text{s\_1612} + \text{s\_1406} \tag{540}$$

Reactants

Table 1081: Properties of each reactant.

Id	Name	SBO
s_0252	3'-Phosphoadenylyl sulfate	
s_1544	Reduced thioredoxin	

Modifiers

Table 1082: Properties of each modifier.

Id	Name	SBO
e_0871	cysH	0000460
e_1172	trxA	0000460
e_0822	trxC	0000460
s_0252	3'-Phosphoadenylyl sulfate	
s_1544	Reduced thioredoxin	
s_0411	Adenosine 3',5'-bisphosphate	
s_1612	Sulfite	
s_1406	Oxidized thioredoxin	

Products

Table 1083: Properties of each product.

Id	Name	SBO
s_0411	Adenosine 3',5'-bisphosphate	
s_1612	Sulfite	
s_1406	Oxidized thioredoxin	

Kinetic Law

Derived unit contains undeclared units

$$v_{270} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0252}] \cdot [\mathrm{s\_1544}] - \frac{[\mathrm{s\_0411}] \cdot [\mathrm{s\_1612}] \cdot [\mathrm{s\_1406}]}{\mathrm{Keq}} \right)}{\mathrm{Km0252} \cdot \mathrm{Km1544}}}{\left(1 + \frac{[\mathrm{s\_0252}]}{\mathrm{Km0252}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1544}]}{\mathrm{Km1544}}\right) + \left(1 + \frac{[\mathrm{s\_0411}]}{\mathrm{Km0411}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1612}]}{\mathrm{Km1612}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1406}]}{\mathrm{Km1406}}\right) - 1} \tag{541}$$

Table 1084: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.755	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0252		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1544		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0411		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1612		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1406		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.271 Reaction r_1141

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoenolpyruvate carboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0543} + \text{s\_1484} \xrightleftharpoons{\text{e\_1240, s\_0543, s\_1484, s\_1399, s\_1430}} \text{s\_1399} + \text{s\_1430} \qquad (542)$$

Reactants

Table 1085: Properties of each reactant.

Id	Name	SBO
s_0543	CO2	
s_1484	Phosphoenolpyruvate	

Modifiers

Table 1086: Properties of each modifier.

Id	Name	SBO
e_1240	ppc	0000460
s_0543	CO2	
s_1484	Phosphoenolpyruvate	
s_1399	Oxaloacetate	
s_1430	Phosphate	

Products

Table 1087: Properties of each product.

Id	Name	SBO
s_1399	Oxaloacetate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{271} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0543}] \cdot [\text{s\_1484}] - \frac{[\text{s\_1399}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0543} \cdot \text{Km1484}}}{\left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_1484}]}{\text{Km1484}}\right) + \left(1 + \frac{[\text{s\_1399}]}{\text{Km1399}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{543}$$

Table 1088: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.493	dimensionless	☑
Vmax		0000324	6.901	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0543		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1484		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1399		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.272 Reaction r_1150

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoglucosamine mutase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0654} \xrightleftharpoons{\text{e\_0987, s\_0654, s\_0653}} \text{s\_0653} \tag{544}$$

Reactant

Table 1089: Properties of each reactant.

Id	Name	SBO
s_0654	D-Glucosamine 6-phosphate	

Modifiers

Table 1090: Properties of each modifier.

Id	Name	SBO
e_0987	glmM	0000460
s_0654	D-Glucosamine 6-phosphate	

Id	Name	SBO
s_0653	D-Glucosamine 1-phosphate	

Product

Table 1091: Properties of each product.

Id	Name	SBO
s_0653	D-Glucosamine 1-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{272} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0654}] - \frac{[\text{s\_0653}]}{\text{Keq}} \right)}{\text{Km0654}}}{1 + \frac{[\text{s\_0654}]}{\text{Km0654}} + 1 + \frac{[\text{s\_0653}]}{\text{Km0653}} - 1} \tag{545}$$

Table 1092: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.079	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0654		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0653		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.273 Reaction r_1151

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoglycerate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0306} + \text{s\_1333} \xrightleftharpoons{\text{e\_0918, s\_0306, s\_1333, s\_0308, s\_1334}} \text{s\_0308} + \text{s\_1334} \tag{546}$$

Reactants

Table 1093: Properties of each reactant.

Id	Name	SBO
s_0306	3-Phospho-D-glycerate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 1094: Properties of each modifier.

Id	Name	SBO
e_0918	serA	0000460
s_0306	3-Phospho-D-glycerate	
s_1333	Nicotinamide adenine dinucleotide	
s_0308	3-Phosphohydroxypyruvate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 1095: Properties of each product.

Id	Name	SBO
s_0308	3-Phosphohydroxypyruvate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{273} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0306}] \cdot [\mathrm{s\_1333}] - \frac{[\mathrm{s\_0308}] \cdot [\mathrm{s\_1334}]}{\mathrm{Keq}} \right)}{\mathrm{Km0306} \cdot \mathrm{Km1333}}}{\left(1 + \frac{[\mathrm{s\_0306}]}{\mathrm{Km0306}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) + \left(1 + \frac{[\mathrm{s\_0308}]}{\mathrm{Km0308}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) - 1} \tag{547}$$

Table 1096: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.147	dimensionless	☑
Vmax		0000324	2.057	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0306		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1333		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0308		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1334		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.274 Reaction r_1152

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoglycerate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0307} + \mathrm{s\_0421} \xrightleftharpoons{\mathrm{e\_0925},\ \mathrm{s\_0307},\ \mathrm{s\_0421},\ \mathrm{s\_0306},\ \mathrm{s\_0467}} \mathrm{s\_0306} + \mathrm{s\_0467} \tag{548}$$

Reactants

Table 1097: Properties of each reactant.

Id	Name	SBO
s_0307	3-Phospho-D-glyceroyl phosphate	
s_0421	ADP	

Modifiers

Table 1098: Properties of each modifier.

Id	Name	SBO
e_0925	pgk	0000460
s_0307	3-Phospho-D-glyceroyl phosphate	
s_0421	ADP	
s_0306	3-Phospho-D-glycerate	
s_0467	ATP	

Products

Table 1099: Properties of each product.

Id	Name	SBO
s_0306	3-Phospho-D-glycerate	
s_0467	ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{274} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0307}] \cdot [\text{s\_0421}] - \frac{[\text{s\_0306}] \cdot [\text{s\_0467}]}{\text{Keq}} \right)}{\text{Km0307} \cdot \text{Km0421}}}{\left(1 + \frac{[\text{s\_0307}]}{\text{Km0307}}\right) \cdot \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) + \left(1 + \frac{[\text{s\_0306}]}{\text{Km0306}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) - 1} \tag{549}$$

Table 1100: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.788	dimensionless	☑
Vmax		0000324	11.030	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0307		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0306		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.275 Reaction r_1153

This is a reversible reaction of one reactant forming one product influenced by five modifiers.

Name phosphoglycerate mutase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0306} \xrightleftharpoons{\text{e\_1108, e\_1373, e\_0264, s\_0306, s\_0675}} \text{s\_0675} \tag{550}$$

Reactant

Table 1101: Properties of each reactant.

Id	Name	SBO
s_0306	3-Phospho-D-glycerate	

Modifiers

Table 1102: Properties of each modifier.

Id	Name	SBO
e_1108	gpmI	0000460
e_1373	gpmB	0000460
e_0264	gpmA	0000460
s_0306	3-Phospho-D-glycerate	
s_0675	D-Glycerate 2-phosphate	

Product

Table 1103: Properties of each product.

Id	Name	SBO
s_0675	D-Glycerate 2-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{275} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0306}] - \frac{[\mathrm{s\_0675}]}{\mathrm{Keq}} \right)}{\mathrm{Km0306}}}{1 + \frac{[\mathrm{s\_0306}]}{\mathrm{Km0306}} + 1 + \frac{[\mathrm{s\_0675}]}{\mathrm{Km0675}} - 1} \tag{551}$$

Table 1104: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.641	dimensionless	☑
Vmax		0000324	3.846	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0306		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0675		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.276 Reaction r_1198

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphomethylpyrimidine kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0313} + \text{s\_0467} \xrightleftharpoons{\text{e\_0641, s\_0313, s\_0467, s\_0218, s\_0421}} \text{s\_0218} + \text{s\_0421} \tag{552}$$

Reactants

Table 1105: Properties of each reactant.

Id	Name	SBO
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0467	ATP	

Modifiers

Table 1106: Properties of each modifier.

Id	Name	SBO
e_0641	thiD	0000460
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0467	ATP	
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0421	ADP	

Products

Table 1107: Properties of each product.

Id	Name	SBO
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{276} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0313}] \cdot [\text{s\_0467}] - \frac{[\text{s\_0218}] \cdot [\text{s\_0421}]}{\text{Keq}} \right)}{\text{Km0313} \cdot \text{Km0467}}}{\left(1 + \frac{[\text{s\_0313}]}{\text{Km0313}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) + \left(1 + \frac{[\text{s\_0218}]}{\text{Km0218}}\right) \cdot \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) - 1} \tag{553}$$

Table 1108: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0313		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0218		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.277 Reaction r_1200

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphopantothenate-cysteine ligase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0599} + \text{s\_0575} + \text{s\_1083} \xrightleftharpoons{\text{e\_1127, s\_0599, s\_0575, s\_1083, s\_1277, s\_0539, s\_0783}} \text{s\_1277} + \text{s\_0539} + \text{s\_0783} \tag{554}$$

Reactants

Table 1109: Properties of each reactant.

Id	Name	SBO
s_0599	D-4'-Phosphopantothenate	
s_0575	CTP	
s_1083	L-Cysteine	

Modifiers

Table 1110: Properties of each modifier.

Id	Name	SBO
e_1127	coaBC	0000460
s_0599	D-4'-Phosphopantothenate	
s_0575	CTP	
s_1083	L-Cysteine	
s_1277	N-((R)-4-Phosphopantothenoyl)-L-cysteine	
s_0539	CMP	
s_0783	Diphosphate	

Products

Table 1111: Properties of each product.

Id	Name	SBO
s_1277	N-((R)-4-Phosphopantothenoyl)-L-cysteine	
s_0539	CMP	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{277} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0599}] \cdot [\mathrm{s\_0575}] \cdot [\mathrm{s\_1083}] - \frac{[\mathrm{s\_1277}] \cdot [\mathrm{s\_0539}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0599} \cdot \mathrm{Km0575} \cdot \mathrm{Km1083}}}{\left(1 + \frac{[\mathrm{s\_0599}]}{\mathrm{Km0599}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0575}]}{\mathrm{Km0575}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1083}]}{\mathrm{Km1083}}\right) + \left(1 + \frac{[\mathrm{s\_1277}]}{\mathrm{Km1277}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0539}]}{\mathrm{Km0539}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) - 1} \tag{555}$$

Table 1112: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.002	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0599		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0575		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1083		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1277		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0539		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.278 Reaction r_1201

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name phosphopantothenoylcysteine decarboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1277} \xrightleftharpoons{\text{e\_1127, s\_1277, s\_0543, s\_1413}} \text{s\_0543} + \text{s\_1413} \tag{556}$$

Reactant

Table 1113: Properties of each reactant.

Id	Name	SBO
s_1277	N-((R)-4-Phosphopantothenoyl)-L-cysteine	

Modifiers

Table 1114: Properties of each modifier.

Id	Name	SBO
e_1127	coaBC	0000460
s_1277	N-((R)-4-Phosphopantothenoyl)-L-cysteine	
s_0543	CO2	
s_1413	Pantetheine 4'-phosphate	

Products

Table 1115: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1413	Pantetheine 4'-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{278} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1277}] - \frac{[\mathrm{s\_0543}] \cdot [\mathrm{s\_1413}]}{\mathrm{Keq}} \right)}{\mathrm{Km1277}}}{1 + \frac{[\mathrm{s\_1277}]}{\mathrm{Km1277}} + \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1413}]}{\mathrm{Km1413}}\right) - 1} \tag{557}$$

Table 1116: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$7.97856388897518 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1277		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1413		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.279 Reaction r_1202

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name phosphopentomutase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0446} \xrightleftharpoons{\mathrm{e\_1023,\ e\_1366,\ s\_0446,\ s\_0445}} \mathrm{s\_0445} \tag{558}$$

Reactant

Table 1117: Properties of each reactant.

Id	Name	SBO
s_0446	alpha-D-Ribose 5-phosphate	

Modifiers

Table 1118: Properties of each modifier.

Id	Name	SBO
e_1023	yhfW	0000460
e_1366	deoB	0000460
s_0446	alpha-D-Ribose 5-phosphate	

Id	Name	SBO
s_0445	alpha-D-Ribose 1-phosphate	

Product

Table 1119: Properties of each product.

Id	Name	SBO
s_0445	alpha-D-Ribose 1-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{279} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0446}] - \frac{[\text{s\_0445}]}{\text{Keq}} \right)}{\text{Km0446}}}{1 + \frac{[\text{s\_0446}]}{\text{Km0446}} + 1 + \frac{[\text{s\_0445}]}{\text{Km0445}} - 1} \tag{559}$$

Table 1120: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.32217621775477 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$5.59330573065286 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0446		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0445		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.280 Reaction r_1204

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoribosyl-AMP cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0098} \xrightleftharpoons{\text{e\_0612, s\_0098, s\_0097}} \text{s\_0097} \tag{560}$$

Reactant

Table 1121: Properties of each reactant.

Id	Name	SBO
s_0098	1-(5-Phosphoribosyl)-AMP	

Modifiers

Table 1122: Properties of each modifier.

Id	Name	SBO
e_0612	hisI	00004
s_0098	1-(5-Phosphoribosyl)-AMP	
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	

Product

Table 1123: Properties of each product.

Id	Name	SBO
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	

Kinetic Law

Derived unit contains undeclared units

$$v_{280} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0098}] - \frac{[\mathrm{s\_0097}]}{\mathrm{Keq}} \right)}{\mathrm{Km0098}}}{1 + \frac{[\mathrm{s\_0098}]}{\mathrm{Km0098}} + 1 + \frac{[\mathrm{s\_0097}]}{\mathrm{Km0097}} - 1} \tag{561}$$

Table 1124: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.079	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0098		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0097		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.281 Reaction r_1205

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name phosphoribosyl-ATP pyrophosphatase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0099} \xrightleftharpoons{\text{e\_0612, s\_0099, s\_0783, s\_0098}} \text{s\_0783} + \text{s\_0098} \tag{562}$$

Reactant

Table 1125: Properties of each reactant.

Id	Name	SBO
s_0099	1-(5-Phosphoribosyl)-ATP	

Modifiers

Table 1126: Properties of each modifier.

Id	Name	SBO
e_0612	hisI	0000460
s_0099	1-(5-Phosphoribosyl)-ATP	
s_0783	Diphosphate	
s_0098	1-(5-Phosphoribosyl)-AMP	

Products

Table 1127: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_0098	1-(5-Phosphoribosyl)-AMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{281} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0099}] - \frac{[\text{s\_0783}] \cdot [\text{s\_0098}]}{\text{Keq}} \right)}{\text{Km0099}}}{1 + \frac{[\text{s\_0099}]}{\text{Km0099}} + \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) \cdot \left(1 + \frac{[\text{s\_0098}]}{\text{Km0098}}\right) - 1} \tag{563}$$

Table 1128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.131	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0099		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0098		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.282 Reaction r_1206

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphoribosylaminoimidazole carboxylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0342} + \text{s\_0467} + \text{s\_0474} \xrightleftharpoons{\text{e\_0184, s\_0342, s\_0467, s\_0474, s\_0362, s\_0421, s\_1430}} \text{s\_0362} + \text{s\_0421} + \text{s\_1430} \tag{564}$$

Reactants

Table 1129: Properties of each reactant.

Id	Name	SBO
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_0467	ATP	
s_0474	Bicarbonate	

Modifiers

Table 1130: Properties of each modifier.

Id	Name	SBO
e_0184	purK	0000460
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_0467	ATP	
s_0474	Bicarbonate	
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 1131: Properties of each product.

Id	Name	SBO
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{282} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0342}] \cdot [\mathrm{s\_0467}] \cdot [\mathrm{s\_0474}] - \frac{[\mathrm{s\_0362}] \cdot [\mathrm{s\_0421}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0342} \cdot \mathrm{Km0467} \cdot \mathrm{Km0474}}}{\left(1 + \frac{[\mathrm{s\_0342}]}{\mathrm{Km0342}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0474}]}{\mathrm{Km0474}}\right) + \left(1 + \frac{[\mathrm{s\_0362}]}{\mathrm{Km0362}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{565}$$

Table 1132: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	1.842	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0342		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0474		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0362		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.283 Reaction r_1207

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoribosylaminoimidazole carboxylase (mutase rxn)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0362} \xrightleftharpoons{\text{e\_0185, s\_0362, s\_0344}} \text{s\_0344} \tag{566}$$

Reactant

Table 1133: Properties of each reactant.

Id	Name	SBO
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	

Modifiers

Table 1134: Properties of each modifier.

Id	Name	SBO
e_0185	purE	0000460
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	

Product

Table 1135: Properties of each product.

Id	Name	SBO
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	

Kinetic Law

Derived unit contains undeclared units

$$v_{283} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0362}] - \frac{[\text{s\_0344}]}{\text{Keq}} \right)}{\text{Km0362}}}{1 + \frac{[\text{s\_0362}]}{\text{Km0362}} + 1 + \frac{[\text{s\_0344}]}{\text{Km0344}} - 1} \tag{567}$$

Table 1136: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	0.368	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0362		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0344		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.284 Reaction r_1208

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name phosphoribosylaminoimidazole synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0162} \xrightleftharpoons{\mathrm{e\_0791,\ s\_0467,\ s\_0162,\ s\_0421,\ s\_0342,\ s\_1430}} \mathrm{s\_0421} + \mathrm{s\_0342} + \mathrm{s\_1430} \tag{568}$$

Reactants

Table 1137: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	

Modifiers

Table 1138: Properties of each modifier.

Id	Name	SBO
e_0791	purM	0000460
s_0467	ATP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	
s_0421	ADP	
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1430	Phosphate	

Products

Table 1139: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{284} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0162}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0342}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0162}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0162}]}{\mathrm{Km0162}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0342}]}{\mathrm{Km0342}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{569}$$

Table 1140: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	1.351	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0162		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0342		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.285 Reaction r_1209

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoribosylaminoimidazolecarboxamide formyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0133} + \mathrm{s\_0343} \xrightleftharpoons{\mathrm{e\_1258,\ s\_0133,\ s\_0343,\ s\_0352,\ s\_0337}} \mathrm{s\_0352} + \mathrm{s\_0337} \tag{570}$$

Reactants

Table 1141: Properties of each reactant.

Id	Name	SBO
s_0133	10-Formyltetrahydrofolate	
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	

Modifiers

Table 1142: Properties of each modifier.

Id	Name	SBO
e_1258	purH	0000460
s_0133	10-Formyltetrahydrofolate	
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 1143: Properties of each product.

Id	Name	SBO
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{285} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0133}] \cdot [\mathrm{s\_0343}] - \frac{[\mathrm{s\_0352}] \cdot [\mathrm{s\_0337}]}{\mathrm{Keq}} \right)}{\mathrm{Km0133} \cdot \mathrm{Km0343}}}{\left(1 + \frac{[\mathrm{s\_0133}]}{\mathrm{Km0133}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0343}]}{\mathrm{Km0343}}\right) + \left(1 + \frac{[\mathrm{s\_0352}]}{\mathrm{Km0352}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0337}]}{\mathrm{Km0337}}\right) - 1} \tag{571}$$

Table 1144: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.075	dimensionless	☑
Vmax		0000324	1.043	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0133		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0343		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0352		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0337		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.286 Reaction r_1210

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphoribosylaminoimidazolesuccinocarboxamide synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0344} + \mathrm{s\_1072} + \mathrm{s\_0467} \underset{(572)}{\overset{\mathrm{e\_0775},\ \mathrm{s\_0344},\ \mathrm{s\_1072},\ \mathrm{s\_0467},\ \mathrm{s\_0040},\ \mathrm{s\_0421},\ \mathrm{s\_1430}}{\rightleftharpoons}} \mathrm{s\_0040} + \mathrm{s\_0421} + \mathrm{s\_1430}$$

Reactants

Table 1145: Properties of each reactant.

Id	Name	SBO
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	
s_1072	L-Aspartate	
s_0467	ATP	

Modifiers

Table 1146: Properties of each modifier.

Id	Name	SBO
e_0775	purC	0000460
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	
s_1072	L-Aspartate	
s_0467	ATP	
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 1147: Properties of each product.

Id	Name	SBO
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{286} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0344}] \cdot [\mathrm{s\_1072}] \cdot [\mathrm{s\_0467}] - \frac{[\mathrm{s\_0040}] \cdot [\mathrm{s\_0421}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0344} \cdot \mathrm{Km1072} \cdot \mathrm{Km0467}}}{\left(1 + \frac{[\mathrm{s\_0344}]}{\mathrm{Km0344}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1072}]}{\mathrm{Km1072}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) + \left(1 + \frac{[\mathrm{s\_0040}]}{\mathrm{Km0040}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{573}$$

Table 1148: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	1.842	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0344		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1072		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0040		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.287 Reaction r_1211

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoribosylanthranilate isomerase (irreversible)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1278} \xrightleftharpoons{\mathrm{e\_0427,\ s\_1278,\ s\_0096}} \mathrm{s\_0096} \tag{574}$$

Reactant

Table 1149: Properties of each reactant.

Id	Name	SBO
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	

Modifiers

Table 1150: Properties of each modifier.

Id	Name	SBO
e_0427	trpC	0000460
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Product

Table 1151: Properties of each product.

Id	Name	SBO
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{287} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1278}] - \frac{[\mathrm{s\_0096}]}{\mathrm{Keq}} \right)}{\mathrm{Km1278}}}{1 + \frac{[\mathrm{s\_1278}]}{\mathrm{Km1278}} + 1 + \frac{[\mathrm{s\_0096}]}{\mathrm{Km0096}} - 1} \tag{575}$$

Table 1152: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	☑
Vmax		0000324	0.047	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1278		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0096		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.288 Reaction r_1212

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name phosphoribosylformylglycinamidine synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1322} + \text{s\_1101} \xrightleftharpoons[(576)]{\text{e\_0815, s\_0467, s\_1322, s\_1101, s\_0421, s\_0162, s\_1095, s\_1430}} \text{s\_0421} + \text{s\_0162} + \text{s\_109}$$

Reactants

Table 1153: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1101	L-Glutamine	

Modifiers

Table 1154: Properties of each modifier.

Id	Name	SBO
e_0815	purL	0000460
s_0467	ATP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1101	L-Glutamine	
s_0421	ADP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	
s_1095	L-Glutamate	
s_1430	Phosphate	

Products

Table 1155: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	
s_1095	L-Glutamate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{288} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1322}] \cdot [\mathrm{s\_1101}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0162}] \cdot [\mathrm{s\_1095}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1322} \cdot \mathrm{Km1101}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1322}]}{\mathrm{Km1322}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1101}]}{\mathrm{Km1101}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0162}]}{\mathrm{Km0162}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) -} \quad (577)$$

Table 1156: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	2.825	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1322		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1101		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0162		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1095		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.289 Reaction r_1214

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphoribosylglycinamide synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0929} + \text{s\_0361} \xrightleftharpoons{\text{e\_1257, s\_0467, s\_0929, s\_0361, s\_0421, s\_1318, s\_1430}} \text{s\_0421} + \text{s\_1318} + \text{s\_1430} \quad (578)$$

Reactants

Table 1157: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0929	Glycine	
s_0361	5-Phospho-beta-D-ribosylamine	

Modifiers

Table 1158: Properties of each modifier.

Id	Name	SBO
e_1257	purD	0000460
s_0467	ATP	
s_0929	Glycine	
s_0361	5-Phospho-beta-D-ribosylamine	
s_0421	ADP	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Products

Table 1159: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{289} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0929}] \cdot [\text{s\_0361}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1318}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0929} \cdot \text{Km0361}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0929}]}{\text{Km0929}}\right) \cdot \left(1 + \frac{[\text{s\_0361}]}{\text{Km0361}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1318}]}{\text{Km1318}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{579}$$

Table 1160: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	☑
Vmax		0000324	1.843	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0929		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0361		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1318		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.290 Reaction r_1215

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoribosylpyrophosphate synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0446} \xrightleftharpoons{\text{e\_0403, s\_0467, s\_0446, s\_0454, s\_0360}} \text{s\_0454} + \text{s\_0360} \tag{580}$$

Reactants

Table 1161: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0446	alpha-D-Ribose 5-phosphate	

Modifiers

Table 1162: Properties of each modifier.

Id	Name	SBO
e_0403	prs	0000460
s_0467	ATP	
s_0446	alpha-D-Ribose 5-phosphate	
s_0454	AMP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Products

Table 1163: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{290} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0446}] - \frac{[\mathrm{s\_0454}] \cdot [\mathrm{s\_0360}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0446}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0446}]}{\mathrm{Km0446}}\right) + \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0360}]}{\mathrm{Km0360}}\right) - 1} \tag{581}$$

Table 1164: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.129	dimensionless	☑
Vmax		0000324	1.800	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0446		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0454		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0360		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.291 Reaction r_1217

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoserine transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0308} + \text{s\_1095} \xrightleftharpoons{\text{e\_0326, s\_0308, s\_1095, s\_0233, s\_1364}} \text{s\_0233} + \text{s\_1364} \tag{582}$$

Reactants

Table 1165: Properties of each reactant.

Id	Name	SBO
s_0308	3-Phosphohydroxypyruvate	
s_1095	L-Glutamate	

Modifiers

Table 1166: Properties of each modifier.

Id	Name	SBO
e_0326	serC	0000460
s_0308	3-Phosphohydroxypyruvate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1364	O-Phospho-L-serine	

Products

Table 1167: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1364	O-Phospho-L-serine	

Kinetic Law

Derived unit contains undeclared units

$$v_{291} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0308}] \cdot [\text{s\_1095}] - \frac{[\text{s\_0233}] \cdot [\text{s\_1364}]}{\text{Keq}} \right)}{\text{Km0308} \cdot \text{Km1095}}}{\left(1 + \frac{[\text{s\_0308}]}{\text{Km0308}}\right) \cdot \left(1 + \frac{[\text{s\_1095}]}{\text{Km1095}}\right) + \left(1 + \frac{[\text{s\_0233}]}{\text{Km0233}}\right) \cdot \left(1 + \frac{[\text{s\_1364}]}{\text{Km1364}}\right) - 1} \tag{583}$$

Table 1168: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.147	dimensionless	☑
Vmax		0000324	2.057	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0308		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1095		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0233		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1364		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.292 Reaction r_1218

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name phosphotransacetylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0393} + \mathrm{s\_0555} \xrightleftharpoons{\mathrm{e\_0768,\ e\_0720,\ s\_0393,\ s\_0555,\ s\_0395,\ s\_1430}} \mathrm{s\_0395} + \mathrm{s\_1430} \qquad (584)$$

Reactants

Table 1169: Properties of each reactant.

Id	Name	SBO
s_0393	Acetyl phosphate	
s_0555	Coenzyme A	

Modifiers

Table 1170: Properties of each modifier.

Id	Name	SBO
e_0768	eutD	0000460
e_0720	pta	0000460
s_0393	Acetyl phosphate	
s_0555	Coenzyme A	
s_0395	Acetyl-CoA	
s_1430	Phosphate	

Products

Table 1171: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{292} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0393}] \cdot [\text{s\_0555}] - \frac{[\text{s\_0395}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0393} \cdot \text{Km0555}}}{\left(1 + \frac{[\text{s\_0393}]}{\text{Km0393}}\right) \cdot \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) + \left(1 + \frac{[\text{s\_0395}]}{\text{Km0395}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{585}$$

Table 1172: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.081	dimensionless	☑
Vmax		0000324	1.130	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0393		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0395		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.293 Reaction r_1220

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Pimeloyl-[ACP] methyl ester esterase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1492} \xrightleftharpoons{\text{e\_1034, s\_1492, s\_1248, s\_1491}} \text{s\_1248} + \text{s\_1491} \tag{586}$$

Reactant

Table 1173: Properties of each reactant.

Id	Name	SBO
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	

Modifiers

Table 1174: Properties of each modifier.

Id	Name	SBO
e_1034	bioH	0000460
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	
s_1248	Methanol	
s_1491	Pimeloyl-[acyl-carrier protein]	

Products

Table 1175: Properties of each product.

Id	Name	SBO
s_1248	Methanol	
s_1491	Pimeloyl-[acyl-carrier protein]	

Kinetic Law

Derived unit contains undeclared units

$$v_{293} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1492}] - \frac{[\mathrm{s\_1248}] \cdot [\mathrm{s\_1491}]}{\mathrm{Keq}} \right)}{\mathrm{Km1492}}}{1 + \frac{[\mathrm{s\_1492}]}{\mathrm{Km1492}} + \left(1 + \frac{[\mathrm{s\_1248}]}{\mathrm{Km1248}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1491}]}{\mathrm{Km1491}}\right) - 1} \tag{587}$$

Table 1176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$2.77033467884759 \cdot 10^{-6}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1492		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1248		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1491		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.294 Reaction r_1222

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name polyphosphate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0421} + \text{s\_0783} \xrightleftharpoons{\text{e\_0793, s\_0421, s\_0783, s\_0467, s\_1430}} \text{s\_0467} + \text{s\_1430} \qquad (588)$$

Reactants

Table 1177: Properties of each reactant.

Id	Name	SBO
s_0421	ADP	
s_0783	Diphosphate	

Modifiers

Table 1178: Properties of each modifier.

Id	Name	SBO
e_0793	ppk	0000460
s_0421	ADP	
s_0783	Diphosphate	
s_0467	ATP	
s_1430	Phosphate	

Products

Table 1179: Properties of each product.

Id	Name	SBO
s_0467	ATP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{294} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0421}] \cdot [\mathrm{s\_0783}] - \frac{[\mathrm{s\_0467}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0421} \cdot \mathrm{Km0783}}}{\left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) + \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{589}$$

Table 1180: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.485	dimensionless	☑
Vmax		0000324	6.785	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0421		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.295 Reaction r_1223

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name porphobilinogen synthase

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\mathrm{s\_0345} \xrightleftharpoons{\mathrm{e\_0134,\ s\_0345,\ s\_1493}} \mathrm{s\_1493} \tag{590}$$

Reactant

Table 1181: Properties of each reactant.

Id	Name	SBO
s_0345	5-Amino-4-oxopentanoate	

Modifiers

Table 1182: Properties of each modifier.

Id	Name	SBO
e_0134	hemB	0000460
s_0345	5-Amino-4-oxopentanoate	

Id	Name	SBO
s_1493	Porphobilinogen	

Product

Table 1183: Properties of each product.

Id	Name	SBO
s_1493	Porphobilinogen	

Kinetic Law

Derived unit contains undeclared units

$$v_{295} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0345}]^2 - \frac{[\mathrm{s\_1493}]}{\mathrm{Keq}} \right)}{\mathrm{Km0345}^2}}{\left(1 + \frac{[\mathrm{s\_0345}]}{\mathrm{Km0345}}\right)^2 + 1 + \frac{[\mathrm{s\_1493}]}{\mathrm{Km1493}} - 1} \tag{591}$$

Table 1184: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.47113853781668 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.002	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	20.000	$\mathrm{mmol}^{-1} \cdot \mathrm{l}$	☑
Km0345		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1493		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.296 Reaction r_1224

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name prephenate dehydratase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1497} \xrightleftharpoons{\mathrm{e\_0825,\ s\_1497,\ s\_0543,\ s\_1429}} \mathrm{s\_0543} + \mathrm{s\_1429} \tag{592}$$

Reactant

Table 1185: Properties of each reactant.

Id	Name	SBO
s_1497	Prephenate	

Modifiers

Table 1186: Properties of each modifier.

Id	Name	SBO
e_0825	pheA	0000460
s_1497	Prephenate	
s_0543	CO2	
s_1429	Phenylpyruvate	

Products

Table 1187: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1429	Phenylpyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{296} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1497}] - \frac{[\text{s\_0543}] \cdot [\text{s\_1429}]}{\text{Keq}} \right)}{\text{Km1497}}}{1 + \frac{[\text{s\_1497}]}{\text{Km1497}} + \left(1 + \frac{[\text{s\_0543}]}{\text{Km0543}}\right) \cdot \left(1 + \frac{[\text{s\_1429}]}{\text{Km1429}}\right) - 1} \tag{593}$$

Table 1188: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.026	dimensionless	☑
Vmax		0000324	0.257	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1497		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1429		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.297 Reaction r_1225

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name prephenate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1333} + \text{s\_1497} \xrightleftharpoons{\text{e\_0826, s\_1333, s\_1497, s\_0262, s\_0543, s\_1334}} \text{s\_0262} + \text{s\_0543} + \text{s\_1334} \tag{594}$$

Reactants

Table 1189: Properties of each reactant.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1497	Prephenate	

Modifiers

Table 1190: Properties of each modifier.

Id	Name	SBO
e_0826	tyrA	0000460
s_1333	Nicotinamide adenine dinucleotide	
s_1497	Prephenate	
s_0262	3-(4-Hydroxyphenyl)pyruvate	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 1191: Properties of each product.

Id	Name	SBO
s_0262	3-(4-Hydroxyphenyl)pyruvate	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{297} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1333}] \cdot [\mathrm{s\_1497}] - \frac{[\mathrm{s\_0262}] \cdot [\mathrm{s\_0543}] \cdot [\mathrm{s\_1334}]}{\mathrm{Keq}} \right)}{\mathrm{Km1333} \cdot \mathrm{Km1497}}}{\left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1497}]}{\mathrm{Km1497}}\right) + \left(1 + \frac{[\mathrm{s\_0262}]}{\mathrm{Km0262}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) - 1} \tag{595}$$

Table 1192: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.019	dimensionless	☑
Vmax		0000324	0.421	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1333		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1497		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0262		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0543		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1334		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.298 Reaction r_1230

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name protoporphyrinogen oxidase (aerobic)

SBO:0000176 biochemical reaction

Reaction equation

$$1 \cdot 5\,\mathrm{s\_1372} + \mathrm{s\_1512} \xrightleftharpoons{\mathrm{e\_1205,\ s\_1372,\ s\_1512,\ s\_1511}} \mathrm{s\_1511} \tag{596}$$

Reactants

Table 1193: Properties of each reactant.

Id	Name	SBO
s_1372	O2	
s_1512	Protoporphyrinogen IX	

Modifiers

Table 1194: Properties of each modifier.

Id	Name	SBO
e_1205	hemG	0000460
s_1372	O2	
s_1512	Protoporphyrinogen IX	
s_1511	Protoporphyrin	

Product

Table 1195: Properties of each product.

Id	Name	SBO
s_1511	Protoporphyrin	

Kinetic Law

Derived unit contains undeclared units

$$v_{298} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1372}] \cdot [\text{s\_1512}] - \frac{[\text{s\_1511}]}{\text{Keq}} \right)}{\text{Km1372} \cdot \text{Km1512}}}{\left(1 + \frac{[\text{s\_1372}]}{\text{Km1372}}\right) \cdot \left(1 + \frac{[\text{s\_1512}]}{\text{Km1512}}\right) + 1 + \frac{[\text{s\_1511}]}{\text{Km1511}} - 1} \tag{597}$$

Table 1196: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222945 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.08892317222945 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km1372		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1512		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1511		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.299 Reaction r_1232

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name purine-nucleoside phosphorylase (Adenosine)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0405} + \text{s\_0445} \xrightleftharpoons{\text{e\_1367, s\_0405, s\_0445, s\_0408, s\_1430}} \text{s\_0408} + \text{s\_1430} \tag{598}$$

Reactants

Table 1197: Properties of each reactant.

Id	Name	SBO
s_0405	Adenine	
s_0445	alpha-D-Ribose 1-phosphate	

Modifiers

Table 1198: Properties of each modifier.

Id	Name	SBO
e_1367	deoD	0000460
s_0405	Adenine	
s_0445	alpha-D-Ribose 1-phosphate	
s_0408	Adenosine	
s_1430	Phosphate	

Products

Table 1199: Properties of each product.

Id	Name	SBO
s_0408	Adenosine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{299} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0405}] \cdot [\text{s\_0445}] - \frac{[\text{s\_0408}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0405} \cdot \text{Km0445}}}{\left(1 + \frac{[\text{s\_0405}]}{\text{Km0405}}\right) \cdot \left(1 + \frac{[\text{s\_0445}]}{\text{Km0445}}\right) + \left(1 + \frac{[\text{s\_0408}]}{\text{Km0408}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{599}$$

Table 1200: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.32217619764956 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0405		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0445		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0408		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.300 Reaction r_1245

This is a reversible reaction of three reactants forming four products influenced by nine modifiers.

Name Pyridoxine 5'-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0116} + \text{s\_1333} + \text{s\_1362} \xrightleftharpoons[(600)]{\text{e\_0818, e\_0022, s\_0116, s\_1333, s\_1362, s\_0543, s\_1334, s\_1530, s\_1430}} \text{s\_0543} + \text{s\_1334}$$

Reactants

Table 1201: Properties of each reactant.

Id	Name	SBO
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_1362	O-Phospho-4-hydroxy-L-threonine	

Modifiers

Table 1202: Properties of each modifier.

Id	Name	SBO
e_0818	pdxJ	0000460
e_0022	pdxA	0000460
s_0116	1-deoxy-D-xylulose 5-phosphate	

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1362	O-Phospho-4-hydroxy-L-threonine	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1530	Pyridoxine 5'-phosphate	
s_1430	Phosphate	

Products

Table 1203: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1530	Pyridoxine 5'-phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{300} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0116}] \cdot [\mathrm{s\_1333}] \cdot [\mathrm{s\_1362}] - \frac{[\mathrm{s\_0543}] \cdot [\mathrm{s\_1334}] \cdot [\mathrm{s\_1530}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0116} \cdot \mathrm{Km1333} \cdot \mathrm{Km1362}}}{\left(1 + \frac{[\mathrm{s\_0116}]}{\mathrm{Km0116}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1362}]}{\mathrm{Km1362}}\right) + \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1530}]}{\mathrm{Km1530}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) -} \quad (601)$$

Table 1204: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.001	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0116		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1333		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1362		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1334		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1530		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.301 Reaction r_1250

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name pyrroline-5-carboxylate reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0128} + \text{s\_1336} \xrightleftharpoons{\text{e\_0137, s\_0128, s\_1336, s\_1335, s\_1155}} \text{s\_1335} + \text{s\_1155} \qquad (602)$$

Reactants

Table 1205: Properties of each reactant.

Id	Name	SBO
s_0128	1-Pyrroline-5-carboxylate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 1206: Properties of each modifier.

Id	Name	SBO
e_0137	proC	0000460
s_0128	1-Pyrroline-5-carboxylate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1155	L-Proline	

Products

Table 1207: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1155	L-Proline	

Kinetic Law

Derived unit contains undeclared units

$$v_{301} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0128}] \cdot [\text{s\_1336}] - \frac{[\text{s\_1335}] \cdot [\text{s\_1155}]}{\text{Keq}} \right)}{\text{Km0128} \cdot \text{Km1336}}}{\left(1 + \frac{[\text{s\_0128}]}{\text{Km0128}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) + \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right) \cdot \left(1 + \frac{[\text{s\_1155}]}{\text{Km1155}}\right) - 1} \tag{603}$$

Table 1208: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	☑
Vmax		0000324	0.429	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0128		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1155		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.302 Reaction r_1251

This is a reversible reaction of three reactants forming three products influenced by nine modifiers.

Name pyruvate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0555} + \text{s\_1333} + \text{s\_1531} \xrightleftharpoons{\text{e\_0052, e\_0051, e\_0053, s\_0555, s\_1333, s\_1531, s\_0395, s\_0543, s\_1334}} \text{s\_0395} + \text{s\_054} \tag{604}$$

Reactants

Table 1209: Properties of each reactant.

Id	Name	SBO
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	
s_1531	Pyruvate	

Modifiers

Table 1210: Properties of each modifier.

Id	Name	SBO
e_0052	aceF	0000460
e_0051	aceE	0000460
e_0053	lpdA	0000460
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	
s_1531	Pyruvate	
s_0395	Acetyl-CoA	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 1211: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{302} = \frac{\frac{\text{vol(cell)}\cdot\text{Vmax}\cdot\left([\text{s\_0555}]\cdot[\text{s\_1333}]\cdot[\text{s\_1531}]-\frac{[\text{s\_0395}]\cdot[\text{s\_0543}]\cdot[\text{s\_1334}]}{\text{Keq}}\right)}{\text{Km0555}\cdot\text{Km1333}\cdot\text{Km1531}}}{\left(1+\frac{[\text{s\_0555}]}{\text{Km0555}}\right)\cdot\left(1+\frac{[\text{s\_1333}]}{\text{Km1333}}\right)\cdot\left(1+\frac{[\text{s\_1531}]}{\text{Km1531}}\right)+\left(1+\frac{[\text{s\_0395}]}{\text{Km0395}}\right)\cdot\left(1+\frac{[\text{s\_0543}]}{\text{Km0543}}\right)\cdot\left(1+\frac{[\text{s\_1334}]}{\text{Km1334}}\right)-1} \quad (605)$$

Table 1212: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.407	dimensionless	☑
Vmax		0000324	12.222	$\text{mmol}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0555		0000322	0.100	$\text{mmol}\cdot\text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol}\cdot\text{l}^{-1}$	☑
Km1531		0000322	0.100	$\text{mmol}\cdot\text{l}^{-1}$	☑
Km0395		0000323	0.100	$\text{mmol}\cdot\text{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0543		0000323	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑
Km1334		0000323	0.100	$\mathrm{mmol}\cdot\mathrm{l}^{-1}$	☑

6.303 Reaction r_1252

This is a reversible reaction of two reactants forming two products influenced by ten modifiers.

Name pyruvate formate lyase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0555} + \mathrm{s\_1531} \xrightleftharpoons{\mathrm{e\_0974},\ \mathrm{e\_1238},\ \mathrm{e\_1239},\ \mathrm{e\_0323},\ \mathrm{e\_0324},\ \mathrm{e\_0821},\ \mathrm{s\_0555},\ \mathrm{s\_1531},\ \mathrm{s\_0395},\ \mathrm{s\_0867}} \mathrm{s\_0395} + \mathrm{s\_0867} \tag{606}$$

Reactants

Table 1213: Properties of each reactant.

Id	Name	SBO
s_0555	Coenzyme A	
s_1531	Pyruvate	

Modifiers

Table 1214: Properties of each modifier.

Id	Name	SBO
e_0974	tdcE	0000460
e_1238	pflD	0000460
e_1239	pflC	0000460
e_0323	pflA	0000460
e_0324	pflB	0000460
e_0821	grcA	0000460
s_0555	Coenzyme A	
s_1531	Pyruvate	
s_0395	Acetyl-CoA	
s_0867	Formate	

Products

Table 1215: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0867	Formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{303} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0555}] \cdot [\mathrm{s\_1531}] - \frac{[\mathrm{s\_0395}] \cdot [\mathrm{s\_0867}]}{\mathrm{Keq}} \right)}{\mathrm{Km0555} \cdot \mathrm{Km1531}}}{\left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1531}]}{\mathrm{Km1531}}\right) + \left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0867}]}{\mathrm{Km0867}}\right) - 1} \tag{607}$$

Table 1216: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.097	dimensionless	☑
Vmax		0000324	1.362	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0555		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1531		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0395		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0867		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.304 Reaction r_1255

This is a reversible reaction of three reactants forming three products influenced by nine modifiers.

Name pyruvate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0555} + 2\,\mathrm{s\_0862} + \mathrm{s\_1531} \xrightleftharpoons{\mathrm{e\_0451,\ e\_0238,\ e\_0911,\ s\_0555,\ s\_0862,\ s\_1531,\ s\_0395,\ s\_0543,\ s\_0861}} \mathrm{s\_0395} + \mathrm{s\_05} \tag{608}$$

Reactants

Table 1217: Properties of each reactant.

Id	Name	SBO
s_0555	Coenzyme A	
s_0862	flavodoxin semi oxidized	
s_1531	Pyruvate	

Modifiers

Table 1218: Properties of each modifier.

Id	Name	SBO
e_0451	ydbK	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0555	Coenzyme A	
s_0862	flavodoxin semi oxidized	
s_1531	Pyruvate	
s_0395	Acetyl-CoA	
s_0543	CO2	
s_0861	Flavodoxin reduced	

Products

Table 1219: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0543	CO2	
s_0861	Flavodoxin reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{304} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0555}] \cdot [\mathrm{s\_0862}]^2 \cdot [\mathrm{s\_1531}] - \frac{[\mathrm{s\_0395}] \cdot [\mathrm{s\_0543}] \cdot [\mathrm{s\_0861}]^2}{\mathrm{Keq}} \right)}{\mathrm{Km0555} \cdot \mathrm{Km0862}^2 \cdot \mathrm{Km1531}}}{\left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0862}]}{\mathrm{Km0862}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_1531}]}{\mathrm{Km1531}}\right) + \left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0861}]}{\mathrm{Km0861}}\right)^2 - 1} \quad (609)$$

Table 1220: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.015	dimensionless	☑
Vmax		0000324	0.934	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0555		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0862		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1531		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0395		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0543		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0861		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.305 Reaction r_1259

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name quinolinate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0772} + \mathrm{s\_1005} \xrightleftharpoons{\mathrm{e\_0260,\ s\_0772,\ s\_1005,\ s\_1430,\ s\_1537}} \mathrm{s\_1430} + \mathrm{s\_1537} \tag{610}$$

Reactants

Table 1221: Properties of each reactant.

Id	Name	SBO
s_0772	Dihydroxyacetone phosphate	
s_1005	Iminoaspartate	

Modifiers

Table 1222: Properties of each modifier.

Id	Name	SBO
e_0260	nadA	0000460
s_0772	Dihydroxyacetone phosphate	
s_1005	Iminoaspartate	
s_1430	Phosphate	

Id	Name	SBO
s_1537	Quinolinate	

Products

Table 1223: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1537	Quinolinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{305} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0772}] \cdot [\text{s\_1005}] - \frac{[\text{s\_1430}] \cdot [\text{s\_1537}]}{\text{Keq}} \right)}{\text{Km0772} \cdot \text{Km1005}}}{\left(1 + \frac{[\text{s\_0772}]}{\text{Km0772}}\right) \cdot \left(1 + \frac{[\text{s\_1005}]}{\text{Km1005}}\right) + \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) \cdot \left(1 + \frac{[\text{s\_1537}]}{\text{Km1537}}\right) - 1} \tag{611}$$

Table 1224: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120467916 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.004	$\text{mmol} \cdot 1^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0772		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km1005		0000322	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑
Km1537		0000323	0.100	$\text{mmol} \cdot 1^{-1}$	☑

6.306 Reaction r_1264

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name riboflavin kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1546} \xrightleftharpoons{\text{e\_0008, s\_0467, s\_1546, s\_0421, s\_0863}} \text{s\_0421} + \text{s\_0863} \tag{612}$$

Reactants

Table 1225: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1546	Riboflavin	

Modifiers

Table 1226: Properties of each modifier.

Id	Name	SBO
e_0008	ribF	0000460
s_0467	ATP	
s_1546	Riboflavin	
s_0421	ADP	
s_0863	FMN	

Products

Table 1227: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0863	FMN	

Kinetic Law

Derived unit contains undeclared units

$$v_{306} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1546}] - \frac{[\text{s\_0421}] \cdot [\text{s\_0863}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1546}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1546}]}{\text{Km1546}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_0863}]}{\text{Km0863}}\right) - 1} \tag{613}$$

Table 1228: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229329 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244121061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1546		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0863		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.307 Reaction r_1265

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name riboflavin synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0311} + \mathrm{s\_0255} \xrightleftharpoons{\mathrm{e\_0531},\ \mathrm{s\_0311},\ \mathrm{s\_0255},\ \mathrm{s\_0364},\ \mathrm{s\_1430}} \mathrm{s\_0364} + \mathrm{s\_1430} \qquad (614)$$

Reactants

Table 1229: Properties of each reactant.

Id	Name	SBO
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_0255	3,4-dihydroxy-2-butanone 4-phosphate	

Modifiers

Table 1230: Properties of each modifier.

Id	Name	SBO
e_0531	ribE	0000460
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_0255	3,4-dihydroxy-2-butanone 4-phosphate	
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	
s_1430	Phosphate	

Products

Table 1231: Properties of each product.

Id	Name	SBO
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{307} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0311}] \cdot [\text{s\_0255}] - \frac{[\text{s\_0364}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0311} \cdot \text{Km0255}}}{\left(1 + \frac{[\text{s\_0311}]}{\text{Km0311}}\right) \cdot \left(1 + \frac{[\text{s\_0255}]}{\text{Km0255}}\right) + \left(1 + \frac{[\text{s\_0364}]}{\text{Km0364}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{615}$$

Table 1232: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.23556926891731 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0311		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0255		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0364		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.308 Reaction r_1266

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name riboflavin synthase

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\text{s\_0364} \xrightleftharpoons{\text{e\_0145, s\_0364, s\_0311, s\_1546}} \text{s\_0311} + \text{s\_1546} \tag{616}$$

Reactant

Table 1233: Properties of each reactant.

Id	Name	SBO
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	

Modifiers

Table 1234: Properties of each modifier.

Id	Name	SBO
e_0145	ribH	0000460
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_1546	Riboflavin	

Products

Table 1235: Properties of each product.

Id	Name	SBO
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_1546	Riboflavin	

Kinetic Law

Derived unit contains undeclared units

$$v_{308} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0364}]^2 - \frac{[\mathrm{s\_0311}] \cdot [\mathrm{s\_1546}]}{\mathrm{Keq}} \right)}{\mathrm{Km0364}^2}}{\left(1 + \frac{[\mathrm{s\_0364}]}{\mathrm{Km0364}}\right)^2 + \left(1 + \frac{[\mathrm{s\_0311}]}{\mathrm{Km0311}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1546}]}{\mathrm{Km1546}}\right) - 1} \tag{617}$$

Table 1236: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$8.64898488242119 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0364		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0311		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1546		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.309 Reaction r_1276

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (ATP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + 2\,\mathrm{s\_0861} \xrightleftharpoons{\mathrm{e\_1335},\ \mathrm{e\_1227},\ \mathrm{e\_1334},\ \mathrm{e\_0238},\ \mathrm{e\_0911},\ \mathrm{s\_0467},\ \mathrm{s\_0861},\ \mathrm{s\_0726},\ \mathrm{s\_0862}} \mathrm{s\_0726} + 2\,\mathrm{s\_0862} \tag{618}$$

Reactants

Table 1237: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0861	Flavodoxin reduced	

Modifiers

Table 1238: Properties of each modifier.

Id	Name	SBO
e_1335	nrdD	0000460
e_1227	fpr	0000460
e_1334	nrdG	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0467	ATP	
s_0861	Flavodoxin reduced	
s_0726	dATP	
s_0862	flavodoxin semi oxidized	

Products

Table 1239: Properties of each product.

Id	Name	SBO
s_0726	dATP	

Id	Name	SBO
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{309} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0861}]^2 - \frac{[\text{s\_0726}] \cdot [\text{s\_0862}]^2}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0861}^2}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0861}]}{\text{Km0861}}\right)^2 + \left(1 + \frac{[\text{s\_0726}]}{\text{Km0726}}\right) \cdot \left(1 + \frac{[\text{s\_0862}]}{\text{Km0862}}\right)^2 - 1} \quad (619)$$

Table 1240: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.109	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0861		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0726		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0862		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.310 Reaction r_1277

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (CTP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0575} + 2\,\text{s\_0861} \xrightleftharpoons{\text{e\_1335, e\_1227, e\_1334, e\_0238, e\_0911, s\_0575, s\_0861, s\_0731, s\_0862}} \text{s\_0731} + 2\,\text{s\_0862} \quad (620)$$

Reactants

Table 1241: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	

Id	Name	SBO
s_0861	Flavodoxin reduced	

Modifiers

Table 1242: Properties of each modifier.

Id	Name	SBO
e_1335	nrdD	0000460
e_1227	fpr	0000460
e_1334	nrdG	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0575	CTP	
s_0861	Flavodoxin reduced	
s_0731	dCTP	
s_0862	flavodoxin semi oxidized	

Products

Table 1243: Properties of each product.

Id	Name	SBO
s_0731	dCTP	
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{310} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0575}] \cdot [\mathrm{s\_0861}]^2 - \frac{[\mathrm{s\_0731}] \cdot [\mathrm{s\_0862}]^2}{\mathrm{Keq}} \right)}{\mathrm{Km0575} \cdot \mathrm{Km0861}^2}}{\left(1 + \frac{[\mathrm{s\_0575}]}{\mathrm{Km0575}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0861}]}{\mathrm{Km0861}}\right)^2 + \left(1 + \frac{[\mathrm{s\_0731}]}{\mathrm{Km0731}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0862}]}{\mathrm{Km0862}}\right)^2 - 1} \tag{621}$$

Table 1244: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.112	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0575		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0861		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0731		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0862		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.311 Reaction r_1278

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (GTP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\mathrm{s\_0861} + \mathrm{s\_0945} \xrightleftharpoons{\mathrm{e\_1335},\ \mathrm{e\_1227},\ \mathrm{e\_1334},\ \mathrm{e\_0238},\ \mathrm{e\_0911},\ \mathrm{s\_0861},\ \mathrm{s\_0945},\ \mathrm{s\_0760},\ \mathrm{s\_0862}} \mathrm{s\_0760} + 2\,\mathrm{s\_0862} \tag{622}$$

Reactants

Table 1245: Properties of each reactant.

Id	Name	SBO
s_0861	Flavodoxin reduced	
s_0945	GTP	

Modifiers

Table 1246: Properties of each modifier.

Id	Name	SBO
e_1335	nrdD	0000460
e_1227	fpr	0000460
e_1334	nrdG	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0861	Flavodoxin reduced	
s_0945	GTP	
s_0760	dGTP	
s_0862	flavodoxin semi oxidized	

Products

Table 1247: Properties of each product.

Id	Name	SBO
s_0760	dGTP	
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{311} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0861}]^2 \cdot [\text{s\_0945}] - \frac{[\text{s\_0760}] \cdot [\text{s\_0862}]^2}{\text{Keq}} \right)}{\text{Km0861}^2 \cdot \text{Km0945}}}{\left(1 + \frac{[\text{s\_0861}]}{\text{Km0861}}\right)^2 \cdot \left(1 + \frac{[\text{s\_0945}]}{\text{Km0945}}\right) + \left(1 + \frac{[\text{s\_0760}]}{\text{Km0760}}\right) \cdot \left(1 + \frac{[\text{s\_0862}]}{\text{Km0862}}\right)^2 - 1} \tag{623}$$

Table 1248: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.112	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0861		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0945		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0760		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0862		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.312 Reaction r_1279

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (UTP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\text{s\_0861} + \text{s\_1792} \xrightleftharpoons{\text{e\_1335, e\_1227, e\_1334, e\_0238, e\_0911, s\_0861, s\_1792, s\_0810, s\_0862}} \text{s\_0810} + 2\,\text{s\_0862} \tag{624}$$

Reactants

Table 1249: Properties of each reactant.

Id	Name	SBO
s_0861	Flavodoxin reduced	
s_1792	UTP	

Modifiers

Table 1250: Properties of each modifier.

Id	Name	SBO
e_1335	nrdD	0000460
e_1227	fpr	0000460
e_1334	nrdG	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0861	Flavodoxin reduced	
s_1792	UTP	
s_0810	dUTP	
s_0862	flavodoxin semi oxidized	

Products

Table 1251: Properties of each product.

Id	Name	SBO
s_0810	dUTP	
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{312} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0861}]^2 \cdot [\mathrm{s\_1792}] - \frac{[\mathrm{s\_0810}] \cdot [\mathrm{s\_0862}]^2}{\mathrm{Keq}} \right)}{\mathrm{Km0861}^2 \cdot \mathrm{Km1792}}}{\left(1 + \frac{[\mathrm{s\_0861}]}{\mathrm{Km0861}}\right)^2 \cdot \left(1 + \frac{[\mathrm{s\_1792}]}{\mathrm{Km1792}}\right) + \left(1 + \frac{[\mathrm{s\_0810}]}{\mathrm{Km0810}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0862}]}{\mathrm{Km0862}}\right)^2 - 1} \tag{625}$$

Table 1252: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.109	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0861		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1792		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0810		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0862		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.313 Reaction r_1284

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name ribose-5-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0704} \xrightleftharpoons{\mathrm{e\_0919,\ e\_1291,\ s\_0704,\ s\_0446}} \mathrm{s\_0446} \tag{626}$$

Reactant

Table 1253: Properties of each reactant.

Id	Name	SBO
s_0704	D-Ribulose 5-phosphate	

Modifiers

Table 1254: Properties of each modifier.

Id	Name	SBO
e_0919	rpiA	0000460
e_1291	rpiB	0000460
s_0704	D-Ribulose 5-phosphate	
s_0446	alpha-D-Ribose 5-phosphate	

Product

Table 1255: Properties of each product.

Id	Name	SBO
s_0446	alpha-D-Ribose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{313} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0704}] - \frac{[\text{s\_0446}]}{\text{Keq}} \right)}{\text{Km0704}}}{1 + \frac{[\text{s\_0704}]}{\text{Km0704}} + 1 + \frac{[\text{s\_0446}]}{\text{Km0446}} - 1} \tag{627}$$

Table 1256: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.102	dimensionless	☑
Vmax		0000324	0.609	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0704		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0446		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.314 Reaction r_1285

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name ribulose 5-phosphate 3-epimerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0721} \xrightleftharpoons{\text{e\_1355, e\_1026, s\_0721, s\_0704}} \text{s\_0704} \tag{628}$$

Reactant

Table 1257: Properties of each reactant.

Id	Name	SBO
s_0721	D-Xylulose 5-phosphate	

Modifiers

Table 1258: Properties of each modifier.

Id	Name	SBO
e_1355	sgcE	0000460
e_1026	rpe	0000460
s_0721	D-Xylulose 5-phosphate	
s_0704	D-Ribulose 5-phosphate	

Product

Table 1259: Properties of each product.

Id	Name	SBO
s_0704	D-Ribulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{314} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0721}] - \frac{[\mathrm{s\_0704}]}{\mathrm{Keq}} \right)}{\mathrm{Km0721}}}{1 + \frac{[\mathrm{s\_0721}]}{\mathrm{Km0721}} + 1 + \frac{[\mathrm{s\_0704}]}{\mathrm{Km0704}} - 1} \tag{629}$$

Table 1260: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.107	dimensionless	☑
Vmax		0000324	0.642	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0721		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0704		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.315 Reaction r_1288

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name S-adenosylhomocysteine nucleosidase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1551} \xrightleftharpoons{\text{e\_0074, s\_1551, s\_0405, s\_1558}} \text{s\_0405} + \text{s\_1558} \tag{630}$$

Reactant

Table 1261: Properties of each reactant.

Id	Name	SBO
s_1551	S-Adenosyl-L-homocysteine	

Modifiers

Table 1262: Properties of each modifier.

Id	Name	SBO
e_0074	mtnN	0000460
s_1551	S-Adenosyl-L-homocysteine	
s_0405	Adenine	
s_1558	S-Ribosyl-L-homocysteine	

Products

Table 1263: Properties of each product.

Id	Name	SBO
s_0405	Adenine	
s_1558	S-Ribosyl-L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{315} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1551}] - \frac{[\text{s\_0405}] \cdot [\text{s\_1558}]}{\text{Keq}} \right)}{\text{Km1551}}}{1 + \frac{[\text{s\_1551}]}{\text{Km1551}} + \left(1 + \frac{[\text{s\_0405}]}{\text{Km0405}}\right) \cdot \left(1 + \frac{[\text{s\_1558}]}{\text{Km1558}}\right) - 1} \tag{631}$$

Table 1264: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.20554969142397 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1551		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0405		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1558		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.316 Reaction r_1291

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name S-ribosylhomocysteine cleavage enzyme

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1558} \xrightleftharpoons{\mathrm{e\_0839},\ \mathrm{s\_1558},\ \mathrm{s\_0310},\ \mathrm{s\_1112}} \mathrm{s\_0310} + \mathrm{s\_1112} \tag{632}$$

Reactant

Table 1265: Properties of each reactant.

Id	Name	SBO
s_1558	S-Ribosyl-L-homocysteine	

Modifiers

Table 1266: Properties of each modifier.

Id	Name	SBO
e_0839	luxS	0000460
s_1558	S-Ribosyl-L-homocysteine	
s_0310	4,5-dihydroxy-2,3-pentanedione	
s_1112	L-Homocysteine	

Products

Table 1267: Properties of each product.

Id	Name	SBO
s_0310	4,5-dihydroxy-2,3-pentanedione	
s_1112	L-Homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{316} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1558}] - \frac{[\text{s\_0310}] \cdot [\text{s\_1112}]}{\text{Keq}} \right)}{\text{Km1558}}}{1 + \frac{[\text{s\_1558}]}{\text{Km1558}} + \left(1 + \frac{[\text{s\_0310}]}{\text{Km0310}}\right) \cdot \left(1 + \frac{[\text{s\_1112}]}{\text{Km1112}}\right) - 1} \tag{633}$$

Table 1268: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.20554969142397 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1558		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0310		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1112		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.317 Reaction r_1301

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name serine O-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0395} + \text{s\_1170} \xrightleftharpoons{\text{e\_1105, s\_0395, s\_1170, s\_1358, s\_0555}} \text{s\_1358} + \text{s\_0555} \tag{634}$$

Reactants

Table 1269: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	

Id	Name	SBO
s_1170	L-Serine	

Modifiers

Table 1270: Properties of each modifier.

Id	Name	SBO
e_1105	cysE	0000460
s_0395	Acetyl-CoA	
s_1170	L-Serine	
s_1358	O-Acetyl-L-serine	
s_0555	Coenzyme A	

Products

Table 1271: Properties of each product.

Id	Name	SBO
s_1358	O-Acetyl-L-serine	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{317} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0395}] \cdot [\mathrm{s\_1170}] - \frac{[\mathrm{s\_1358}] \cdot [\mathrm{s\_0555}]}{\mathrm{Keq}} \right)}{\mathrm{Km0395} \cdot \mathrm{Km1170}}}{\left(1 + \frac{[\mathrm{s\_0395}]}{\mathrm{Km0395}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1170}]}{\mathrm{Km1170}}\right) + \left(1 + \frac{[\mathrm{s\_1358}]}{\mathrm{Km1358}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0555}]}{\mathrm{Km0555}}\right) - 1} \tag{635}$$

Table 1272: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.481	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0395		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1170		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1358		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0555		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.318 Reaction r_1304

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name shikimate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0270} + \text{s\_1336} \xrightleftharpoons{\text{e\_1010, e\_0540, s\_0270, s\_1336, s\_1335, s\_1571}} \text{s\_1335} + \text{s\_1571} \qquad (636)$$

Reactants

Table 1273: Properties of each reactant.

Id	Name	SBO
s_0270	3-Dehydroshikimate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 1274: Properties of each modifier.

Id	Name	SBO
e_1010	aroE	0000460
e_0540	ydiB	0000460
s_0270	3-Dehydroshikimate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1571	Shikimate	

Products

Table 1275: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1571	Shikimate	

Kinetic Law

Derived unit contains undeclared units

$$v_{318} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0270}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_1335}] \cdot [\mathrm{s\_1571}]}{\mathrm{Keq}} \right)}{\mathrm{Km0270} \cdot \mathrm{Km1336}}}{\left(1 + \frac{[\mathrm{s\_0270}]}{\mathrm{Km0270}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1571}]}{\mathrm{Km1571}}\right) - 1} \tag{637}$$

Table 1276: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	☑
Vmax		0000324	0.739	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0270		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1571		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.319 Reaction r_1305

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name shikimate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_1571} \xrightleftharpoons{\mathrm{e\_1028,\ e\_0138,\ s\_0467,\ s\_1571,\ s\_0421,\ s\_1574}} \mathrm{s\_0421} + \mathrm{s\_1574} \tag{638}$$

Reactants

Table 1277: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1571	Shikimate	

Modifiers

Table 1278: Properties of each modifier.

Id	Name	SBO
e_1028	aroK	0000460
e_0138	aroL	0000460
s_0467	ATP	
s_1571	Shikimate	
s_0421	ADP	
s_1574	Shikimate 5-phosphate	

Products

Table 1279: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1574	Shikimate 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{319} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1571}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_1574}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1571}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1571}]}{\mathrm{Km1571}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1574}]}{\mathrm{Km1574}}\right) - 1} \tag{639}$$

Table 1280: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	☑
Vmax		0000324	0.739	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1571		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1574		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.320 Reaction r_1306

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name sirohydrochlorin dehydrogenase (NAD)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0768} + \text{s\_1333} \xrightleftharpoons{\text{e\_1019, s\_0768, s\_1333, s\_1334, s\_1578}} \text{s\_1334} + \text{s\_1578} \tag{640}$$

Reactants

Table 1281: Properties of each reactant.

Id	Name	SBO
s_0768	dihydrosirohydrochlorin	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 1282: Properties of each modifier.

Id	Name	SBO
e_1019	cysG	0000460
s_0768	dihydrosirohydrochlorin	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1578	sirohydrochlorin	

Products

Table 1283: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1578	sirohydrochlorin	

Kinetic Law

Derived unit contains undeclared units

$$v_{320} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0768}] \cdot [\text{s\_1333}] - \frac{[\text{s\_1334}] \cdot [\text{s\_1578}]}{\text{Keq}} \right)}{\text{Km0768} \cdot \text{Km1333}}}{\left(1 + \frac{[\text{s\_0768}]}{\text{Km0768}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) + \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) \cdot \left(1 + \frac{[\text{s\_1578}]}{\text{Km1578}}\right) - 1} \tag{641}$$

Table 1284: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0768		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1333		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1334		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1578		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.321 Reaction r_1307

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name sirohydrochlorin ferrochelatase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0838} + \mathrm{s\_1578} \xrightleftharpoons{\mathrm{e\_1019},\ \mathrm{s\_0838},\ \mathrm{s\_1578},\ \mathrm{s\_1577}} \mathrm{s\_1577} \tag{642}$$

Reactants

Table 1285: Properties of each reactant.

Id	Name	SBO
s_0838	Fe2+	
s_1578	sirohydrochlorin	

Modifiers

Table 1286: Properties of each modifier.

Id	Name	SBO
e_1019	cysG	0000460
s_0838	Fe2+	
s_1578	sirohydrochlorin	
s_1577	Siroheme	

Product

Table 1287: Properties of each product.

Id	Name	SBO
s_1577	Siroheme	

Kinetic Law

Derived unit contains undeclared units

$$v_{321} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0838}] \cdot [\text{s\_1578}] - \frac{[\text{s\_1577}]}{\text{Keq}} \right)}{\text{Km0838} \cdot \text{Km1578}}}{\left(1 + \frac{[\text{s\_0838}]}{\text{Km0838}}\right) \cdot \left(1 + \frac{[\text{s\_1578}]}{\text{Km1578}}\right) + 1 + \frac{[\text{s\_1577}]}{\text{Km1577}} - 1} \tag{643}$$

Table 1288: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.08892317229363 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km0838		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1578		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1577		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.322 Reaction r_1315

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name succinyl-CoA synthetase (ADP-forming)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0555} + \text{s\_1595} \xrightleftharpoons{\text{e\_0253, e\_0254, s\_0467, s\_0555, s\_1595, s\_0421, s\_1430, s\_1599}} \text{s\_0421} + \text{s\_1430} + \text{s\_159} \tag{644}$$

Reactants

Table 1289: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0555	Coenzyme A	
s_1595	Succinate	

Modifiers

Table 1290: Properties of each modifier.

Id	Name	SBO
e_0253	sucC	0000460
e_0254	sucD	0000460
s_0467	ATP	
s_0555	Coenzyme A	
s_1595	Succinate	
s_0421	ADP	
s_1430	Phosphate	
s_1599	Succinyl-CoA	

Products

Table 1291: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1599	Succinyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{322} = \frac{\frac{\text{vol(cell)}\cdot\text{Vmax}\cdot\left([\text{s\_0467}]\cdot[\text{s\_0555}]\cdot[\text{s\_1595}]-\frac{[\text{s\_0421}]\cdot[\text{s\_1430}]\cdot[\text{s\_1599}]}{\text{Keq}}\right)}{\text{Km0467}\cdot\text{Km0555}\cdot\text{Km1595}}}{\left(1+\frac{[\text{s\_0467}]}{\text{Km0467}}\right)\cdot\left(1+\frac{[\text{s\_0555}]}{\text{Km0555}}\right)\cdot\left(1+\frac{[\text{s\_1595}]}{\text{Km1595}}\right)+\left(1+\frac{[\text{s\_0421}]}{\text{Km0421}}\right)\cdot\left(1+\frac{[\text{s\_1430}]}{\text{Km1430}}\right)\cdot\left(1+\frac{[\text{s\_1599}]}{\text{Km1599}}\right)-1} \quad (645)$$

Table 1292: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.073	dimensionless	☑
Vmax		0000324	2.181	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0555		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1595		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1599		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.323 Reaction r_1316

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name succinyl-diaminopimelate desuccinylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1316} \xrightleftharpoons{\mathrm{e\_0774,\ s\_1316,\ s\_1211,\ s\_1595}} \mathrm{s\_1211} + \mathrm{s\_1595} \tag{646}$$

Reactant

Table 1293: Properties of each reactant.

Id	Name	SBO
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	

Modifiers

Table 1294: Properties of each modifier.

Id	Name	SBO
e_0774	dapE	0000460
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	
s_1211	LL-2,6-Diaminoheptanedioate	
s_1595	Succinate	

Products

Table 1295: Properties of each product.

Id	Name	SBO
s_1211	LL-2,6-Diaminoheptanedioate	
s_1595	Succinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{323} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1316}] - \frac{[\text{s\_1211}] \cdot [\text{s\_1595}]}{\text{Keq}} \right)}{\text{Km1316}}}{1 + \frac{[\text{s\_1316}]}{\text{Km1316}} + \left(1 + \frac{[\text{s\_1211}]}{\text{Km1211}}\right) \cdot \left(1 + \frac{[\text{s\_1595}]}{\text{Km1595}}\right) - 1} \tag{647}$$

Table 1296: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	☑
Vmax		0000324	0.514	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1316		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1211		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1595		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.324 Reaction r_1318

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name succinyldiaminopimelate transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1095} + \text{s\_1315} \xrightleftharpoons{\text{e\_1014, s\_1095, s\_1315, s\_0233, s\_1316}} \text{s\_0233} + \text{s\_1316} \tag{648}$$

Reactants

Table 1297: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	

Modifiers

Table 1298: Properties of each modifier.

Id	Name	SBO
e_1014	argD	0000460
s_1095	L-Glutamate	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	
s_0233	2-Oxoglutarate	
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	

Products

Table 1299: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	

Kinetic Law

Derived unit contains undeclared units

$$v_{324} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1095}] \cdot [\mathrm{s\_1315}] - \frac{[\mathrm{s\_0233}] \cdot [\mathrm{s\_1316}]}{\mathrm{Keq}} \right)}{\mathrm{Km1095} \cdot \mathrm{Km1315}}}{\left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1315}]}{\mathrm{Km1315}}\right) + \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1316}]}{\mathrm{Km1316}}\right) - 1} \tag{649}$$

Table 1300: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	☑
Vmax		0000324	0.719	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1095		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1315		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0233		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1316		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.325 Reaction r_1329

This is a reversible reaction of three reactants forming four products influenced by nine modifiers.

Name Sulfate adenyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_0945} + \mathrm{s\_1609} \xrightleftharpoons{\mathrm{e\_0869},\ \mathrm{e\_0870},\ \mathrm{s\_0467},\ \mathrm{s\_0945},\ \mathrm{s\_1609},\ \mathrm{s\_0412},\ \mathrm{s\_0896},\ \mathrm{s\_1430},\ \mathrm{s\_0783}} \mathrm{s\_0412} + \mathrm{s\_0896} \quad (650)$$

Reactants

Table 1301: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0945	GTP	
s_1609	Sulfate	

Modifiers

Table 1302: Properties of each modifier.

Id	Name	SBO
e_0869	cysN	0000460
e_0870	cysD	0000460
s_0467	ATP	
s_0945	GTP	
s_1609	Sulfate	
s_0412	Adenosine 5'-phosphosulfate	
s_0896	GDP	
s_1430	Phosphate	
s_0783	Diphosphate	

Products

Table 1303: Properties of each product.

Id	Name	SBO
s_0412	Adenosine 5'-phosphosulfate	
s_0896	GDP	
s_1430	Phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{325} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0945}] \cdot [\mathrm{s\_1609}] - \frac{[\mathrm{s\_0412}] \cdot [\mathrm{s\_0896}] \cdot [\mathrm{s\_1430}] \cdot [\mathrm{s\_0783}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0945} \cdot \mathrm{Km1609}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0945}]}{\mathrm{Km0945}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1609}]}{\mathrm{Km1609}}\right) + \left(1 + \frac{[\mathrm{s\_0412}]}{\mathrm{Km0412}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0896}]}{\mathrm{Km0896}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) -} \quad (651)$$

Table 1304: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	1.579	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0945		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1609		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0412		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0896		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0783		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.326 Reaction r_1330

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name sulfite reductase (NADPH2)

SBO:0000176 biochemical reaction

Reaction equation

$$3\,\text{s\_1336} + \text{s\_1612} \xrightleftharpoons{\text{e\_0872, e\_0873, s\_1336, s\_1612, s\_0994, s\_1335}} \text{s\_0994} + 3\,\text{s\_1335} \quad (652)$$

Reactants

Table 1305: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1612	Sulfite	

Modifiers

Table 1306: Properties of each modifier.

Id	Name	SBO
e_0872	cysI	0000460
e_0873	cysJ	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1612	Sulfite	
s_0994	Hydrogen sulfide	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 1307: Properties of each product.

Id	Name	SBO
s_0994	Hydrogen sulfide	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{326} = \frac{\dfrac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1336}]^3 \cdot [\text{s\_1612}] - \frac{[\text{s\_0994}] \cdot [\text{s\_1335}]^3}{\text{Keq}} \right)}{\text{Km1336}^3 \cdot \text{Km1612}}}{\left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right)^3 \cdot \left(1 + \frac{[\text{s\_1612}]}{\text{Km1612}}\right) + \left(1 + \frac{[\text{s\_0994}]}{\text{Km0994}}\right) \cdot \left(1 + \frac{[\text{s\_1335}]}{\text{Km1335}}\right)^3 - 1} \quad (653)$$

Table 1308: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	2.129	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1612		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0994		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.327 Reaction r_1335

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name tartronate semialdehyde reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0214} + \mathrm{s\_1334} \xrightleftharpoons{\mathrm{e\_0979,\ e\_0177,\ s\_0214,\ s\_1334,\ s\_0029,\ s\_1333}} \mathrm{s\_0029} + \mathrm{s\_1333} \qquad (654)$$

Reactants

Table 1309: Properties of each reactant.

Id	Name	SBO
s_0214	2-Hydroxy-3-oxopropanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 1310: Properties of each modifier.

Id	Name	SBO
e_0979	garR	0000460
e_0177	glxR	0000460
s_0214	2-Hydroxy-3-oxopropanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0029	(R)-Glycerate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 1311: Properties of each product.

Id	Name	SBO
s_0029	(R)-Glycerate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{327} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0214}] \cdot [\text{s\_1334}] - \frac{[\text{s\_0029}] \cdot [\text{s\_1333}]}{\text{Keq}} \right)}{\text{Km0214} \cdot \text{Km1334}}}{\left(1 + \frac{[\text{s\_0214}]}{\text{Km0214}}\right) \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) + \left(1 + \frac{[\text{s\_0029}]}{\text{Km0029}}\right) \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) - 1} \tag{655}$$

Table 1312: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338474645892 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.48673864504249 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0214		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0029		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.328 Reaction r_1337

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Tetraacyldisaccharide 4'kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_1204} \xrightleftharpoons{\text{e\_0330, s\_0467, s\_1204, s\_0421, s\_0147}} \text{s\_0421} + \text{s\_0147} \tag{656}$$

Reactants

Table 1313: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1204	Lipid A Disaccharide	

Modifiers

Table 1314: Properties of each modifier.

Id	Name
e_0330	lpxK
s_0467	ATP
s_1204	Lipid A Disaccharide
s_0421	ADP
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

Products

Table 1315: Properties of each product.

Id	Name
s_0421	ADP
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

Kinetic Law

Derived unit contains undeclared units

$$v_{328} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_1204}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_0147}]}{\mathrm{Keq}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km1204}}}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1204}]}{\mathrm{Km1204}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0147}]}{\mathrm{Km0147}}\right) - 1} \tag{657}$$

Table 1316: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	☑
Vmax		0000324	0.038	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1204		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0421		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0147		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.329 Reaction r_1338

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name tetrahydrodipicolinate succinylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1599} + \mathrm{s\_0148} \xrightleftharpoons{\mathrm{e\_0076,\ s\_1599,\ s\_0148,\ s\_0555,\ s\_1315}} \mathrm{s\_0555} + \mathrm{s\_1315} \tag{658}$$

Reactants

Table 1317: Properties of each reactant.

Id	Name	SBO
s_1599	Succinyl-CoA	
s_0148	2,3,4,5-Tetrahydrodipicolinate	

Modifiers

Table 1318: Properties of each modifier.

Id	Name	SBO
e_0076	dapD	0000460
s_1599	Succinyl-CoA	
s_0148	2,3,4,5-Tetrahydrodipicolinate	
s_0555	Coenzyme A	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	

Products

Table 1319: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	

Kinetic Law

Derived unit contains undeclared units

$$v_{329} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1599}] \cdot [\text{s\_0148}] - \frac{[\text{s\_0555}] \cdot [\text{s\_1315}]}{\text{Keq}} \right)}{\text{Km1599} \cdot \text{Km0148}}}{\left(1 + \frac{[\text{s\_1599}]}{\text{Km1599}}\right) \cdot \left(1 + \frac{[\text{s\_0148}]}{\text{Km0148}}\right) + \left(1 + \frac{[\text{s\_0555}]}{\text{Km0555}}\right) \cdot \left(1 + \frac{[\text{s\_1315}]}{\text{Km1315}}\right) - 1} \tag{659}$$

Table 1320: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	☑
Vmax		0000324	0.719	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1599		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0148		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1315		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.330 Reaction r_1344

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name thiamine-phosphate diphosphorylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0218} + \text{s\_0330} \xrightleftharpoons{\text{e\_1253, s\_0218, s\_0330, s\_0783, s\_1643}} \text{s\_0783} + \text{s\_1643} \tag{660}$$

Reactants

Table 1321: Properties of each reactant.

Id	Name	SBO
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	

Modifiers

Table 1322: Properties of each modifier.

Id	Name	SBO
e_1253	thiE	0000460
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	
s_0783	Diphosphate	
s_1643	Thiamin monophosphate	

Products

Table 1323: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1643	Thiamin monophosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{330} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0218}] \cdot [\mathrm{s\_0330}] - \frac{[\mathrm{s\_0783}] \cdot [\mathrm{s\_1643}]}{\mathrm{Keq}} \right)}{\mathrm{Km0218} \cdot \mathrm{Km0330}}}{\left(1 + \frac{[\mathrm{s\_0218}]}{\mathrm{Km0218}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0330}]}{\mathrm{Km0330}}\right) + \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1643}]}{\mathrm{Km1643}}\right) - 1} \tag{661}$$

Table 1324: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0218		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0330		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1643		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.331 Reaction r_1345

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name thiamine-phosphate kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_1643} \xrightleftharpoons{\mathrm{e\_0146},\ \mathrm{s\_0467},\ \mathrm{s\_1643},\ \mathrm{s\_0421},\ \mathrm{s\_1644}} \mathrm{s\_0421} + \mathrm{s\_1644} \qquad (662)$$

Reactants

Table 1325: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1643	Thiamin monophosphate	

Modifiers

Table 1326: Properties of each modifier.

Id	Name	SBO
e_0146	thiL	0000460
s_0467	ATP	
s_1643	Thiamin monophosphate	
s_0421	ADP	
s_1644	Thiamine diphosphate	

Products

Table 1327: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1644	Thiamine diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{331} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1643}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1644}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1643}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1643}]}{\text{Km1643}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1644}]}{\text{Km1644}}\right) - 1} \tag{663}$$

Table 1328: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1643		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1644		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.332 Reaction r_1346

This is a reversible reaction of five reactants forming six products influenced by 16 modifiers.

Name thiazole phosphate synthesis

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0738} + \text{s\_0116} + \text{s\_1018} + \text{s\_1336} \xrightleftharpoons{\text{e\_1374, e\_1250, e\_0805, e\_0151, e\_1252, s\_0467, s\_0738, s\_0116, s\_10}} \tag{664}$$

Reactants

Table 1329: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0738	dehydroglycine	
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1018	IscS with bound sulfur	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 1330: Properties of each modifier.

Id	Name	SBO
e_1374	thiS	0000460
e_1250	thiH	0000460
e_0805	iscS	0000460
e_0151	thiI	0000460
e_1252	thiF	0000460
s_0467	ATP	
s_0738	dehydroglycine	
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1018	IscS with bound sulfur	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	
s_0454	AMP	
s_0543	CO2	
s_1017	IscS sulfur acceptor protein	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0783	Diphosphate	

Products

Table 1331: Properties of each product.

Id	Name	SBO
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	
s_0454	AMP	
s_0543	CO2	
s_1017	IscS sulfur acceptor protein	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0783	Diphosphate	

Id	Name	SBO

Kinetic Law

Derived unit contains undeclared units

$$v_{332} = \frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0467}] \cdot [\mathrm{s\_0738}] \cdot [\mathrm{s\_0116}] \cdot [\mathrm{s\_1018}] \cdot [\mathrm{s\_1336}] - \frac{[\mathrm{s\_0330}] \cdot [\mathrm{s\_0454}] \cdot [\mathrm{s\_0543}] \cdot [}{\mathrm{Ke}} \right)}{\mathrm{Km0467} \cdot \mathrm{Km0738} \cdot \mathrm{Km0116} \cdot \mathrm{Km1018} \cdot \mathrm{Km1336}} \quad (665)$$

$$= \frac{}{\left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0738}]}{\mathrm{Km0738}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0116}]}{\mathrm{Km0116}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1018}]}{\mathrm{Km1018}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) + \left(1 + \frac{[\mathrm{s\_0330}]}{\mathrm{Km0330}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0454}]}{\mathrm{Km0454}}\right) \cdot}$$

Table 1332: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.006	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0467		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0738		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0116		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1018		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0330		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0454		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1017		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.333 Reaction r_1347

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name thioredoxin reductase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1336} + \mathrm{s\_1406} \xrightleftharpoons{\mathrm{e\_1172,\ e\_0822,\ e\_0318,\ s\_1336,\ s\_1406,\ s\_1335,\ s\_1544}} \mathrm{s\_1335} + \mathrm{s\_1544} \quad (666)$$

Reactants

Table 1333: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1406	Oxidized thioredoxin	

Modifiers

Table 1334: Properties of each modifier.

Id	Name	SBO
e_1172	trxA	0000460
e_0822	trxC	0000460
e_0318	trxB	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1406	Oxidized thioredoxin	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1544	Reduced thioredoxin	

Products

Table 1335: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1544	Reduced thioredoxin	

Kinetic Law

Derived unit contains undeclared units

$$v_{333} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1336}] \cdot [\mathrm{s\_1406}] - \frac{[\mathrm{s\_1335}] \cdot [\mathrm{s\_1544}]}{\mathrm{Keq}} \right)}{\mathrm{Km1336} \cdot \mathrm{Km1406}}}{\left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1406}]}{\mathrm{Km1406}}\right) + \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1544}]}{\mathrm{Km1544}}\right) - 1} \tag{667}$$

Table 1336: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	☑
Vmax		0000324	0.481	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1336		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1406		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1335		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1544		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.334 Reaction r_1348

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name Threonine aldolase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1179} \xrightleftharpoons{\mathrm{e\_0313,\ e\_0813,\ s\_1179,\ s\_0381,\ s\_0929}} \mathrm{s\_0381} + \mathrm{s\_0929} \tag{668}$$

Reactant

Table 1337: Properties of each reactant.

Id	Name	SBO
s_1179	L-Threonine	

Modifiers

Table 1338: Properties of each modifier.

Id	Name	SBO
e_0313	ltaE	0000460
e_0813	glyA	0000460
s_1179	L-Threonine	
s_0381	Acetaldehyde	
s_0929	Glycine	

Products

Table 1339: Properties of each product.

Id	Name	SBO
s_0381	Acetaldehyde	
s_0929	Glycine	

Kinetic Law

Derived unit contains undeclared units

$$v_{334} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1179}] - \frac{[\mathrm{s\_0381}] \cdot [\mathrm{s\_0929}]}{\mathrm{Keq}} \right)}{\mathrm{Km1179}}}{1 + \frac{[\mathrm{s\_1179}]}{\mathrm{Km1179}} + \left(1 + \frac{[\mathrm{s\_0381}]}{\mathrm{Km0381}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0929}]}{\mathrm{Km0929}}\right) - 1} \tag{669}$$

Table 1340: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	☑
Vmax		0000324	0.414	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1179		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0381		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0929		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.335 Reaction r_1349

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name threonine synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1363} \xrightleftharpoons{\mathrm{e\_0003,\ s\_1363,\ s\_1430,\ s\_1179}} \mathrm{s\_1430} + \mathrm{s\_1179} \tag{670}$$

Reactant

Table 1341: Properties of each reactant.

Id	Name	SBO
s_1363	O-Phospho-L-homoserine	

Modifiers

Table 1342: Properties of each modifier.

Id	Name	SBO
e_0003	thrC	0000460
s_1363	O-Phospho-L-homoserine	
s_1430	Phosphate	
s_1179	L-Threonine	

Products

Table 1343: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1179	L-Threonine	

Kinetic Law

Derived unit contains undeclared units

$$v_{335} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1363}] - \frac{[\mathrm{s\_1430}] \cdot [\mathrm{s\_1179}]}{\mathrm{Keq}} \right)}{\mathrm{Km1363}}}{1 + \frac{[\mathrm{s\_1363}]}{\mathrm{Km1363}} + \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1179}]}{\mathrm{Km1179}}\right) - 1} \tag{671}$$

Table 1344: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.158	dimensionless	☑
Vmax		0000324	1.582	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1363		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1179		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.336 Reaction r_1353

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name thymidylate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0807} + \text{s\_0336} \xrightleftharpoons{\text{e\_0894, s\_0807, s\_0336, s\_0372, s\_0802}} \text{s\_0372} + \text{s\_0802} \tag{672}$$

Reactants

Table 1345: Properties of each reactant.

Id	Name	SBO
s_0807	dUMP	
s_0336	5,10-Methylenetetrahydrofolate	

Modifiers

Table 1346: Properties of each modifier.

Id	Name	SBO
e_0894	thyA	0000460
s_0807	dUMP	
s_0336	5,10-Methylenetetrahydrofolate	
s_0372	7,8-Dihydrofolate	
s_0802	dTMP	

Products

Table 1347: Properties of each product.

Id	Name	SBO
s_0372	7,8-Dihydrofolate	
s_0802	dTMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{336} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0807}] \cdot [\text{s\_0336}] - \frac{[\text{s\_0372}] \cdot [\text{s\_0802}]}{\text{Keq}} \right)}{\text{Km0807} \cdot \text{Km0336}}}{\left(1 + \frac{[\text{s\_0807}]}{\text{Km0807}}\right) \cdot \left(1 + \frac{[\text{s\_0336}]}{\text{Km0336}}\right) + \left(1 + \frac{[\text{s\_0372}]}{\text{Km0372}}\right) \cdot \left(1 + \frac{[\text{s\_0802}]}{\text{Km0802}}\right) - 1} \tag{673}$$

Table 1348: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.051	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0807		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0372		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0802		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.337 Reaction r_1356

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name transaldolase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0621} + \text{s\_0627} \xrightleftharpoons{\text{e\_0770, e\_0005, s\_0621, s\_0627, s\_0913, s\_1561}} \text{s\_0913} + \text{s\_1561} \tag{674}$$

Reactants

Table 1349: Properties of each reactant.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_0627	D-Fructose 6-phosphate	

Modifiers

Table 1350: Properties of each modifier.

Id	Name	SBO
e_0770	talA	0000460

Id	Name	SBO
e_0005	talB	0000460
s_0621	D-Erythrose 4-phosphate	
s_0627	D-Fructose 6-phosphate	
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	

Products

Table 1351: Properties of each product.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{337} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0621}] \cdot [\text{s\_0627}] - \frac{[\text{s\_0913}] \cdot [\text{s\_1561}]}{\text{Keq}} \right)}{\text{Km0621} \cdot \text{Km0627}}}{\left(1 + \frac{[\text{s\_0621}]}{\text{Km0621}}\right) \cdot \left(1 + \frac{[\text{s\_0627}]}{\text{Km0627}}\right) + \left(1 + \frac{[\text{s\_0913}]}{\text{Km0913}}\right) \cdot \left(1 + \frac{[\text{s\_1561}]}{\text{Km1561}}\right) - 1} \tag{675}$$

Table 1352: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.027	dimensionless	☑
Vmax		0000324	0.380	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0621		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0627		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0913		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1561		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.338 Reaction r_1357

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name transketolase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0913} + \text{s\_1561} \xrightleftharpoons{\text{e\_0771, e\_0928, s\_0913, s\_1561, s\_0446, s\_0721}} \text{s\_0446} + \text{s\_0721} \qquad (676)$$

Reactants

Table 1353: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	

Modifiers

Table 1354: Properties of each modifier.

Id	Name	SBO
e_0771	tktB	0000460
e_0928	tktA	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	
s_0446	alpha-D-Ribose 5-phosphate	
s_0721	D-Xylulose 5-phosphate	

Products

Table 1355: Properties of each product.

Id	Name	SBO
s_0446	alpha-D-Ribose 5-phosphate	
s_0721	D-Xylulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{338} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0913}] \cdot [\text{s\_1561}] - \frac{[\text{s\_0446}] \cdot [\text{s\_0721}]}{\text{Keq}} \right)}{\text{Km0913} \cdot \text{Km1561}}}{\left(1 + \frac{[\text{s\_0913}]}{\text{Km0913}}\right) \cdot \left(1 + \frac{[\text{s\_1561}]}{\text{Km1561}}\right) + \left(1 + \frac{[\text{s\_0446}]}{\text{Km0446}}\right) \cdot \left(1 + \frac{[\text{s\_0721}]}{\text{Km0721}}\right) - 1} \qquad (677)$$

Table 1356: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.027	dimensionless	☑
Vmax		0000324	0.380	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0913		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1561		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0446		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0721		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.339 Reaction r_1358

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name transketolase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0627} + \mathrm{s\_0913} \xrightleftharpoons{\mathrm{e\_0771,\ e\_0928,\ s\_0627,\ s\_0913,\ s\_0621,\ s\_0721}} \mathrm{s\_0621} + \mathrm{s\_0721} \qquad (678)$$

Reactants

Table 1357: Properties of each reactant.

Id	Name	SBO
s_0627	D-Fructose 6-phosphate	
s_0913	Glyceraldehyde 3-phosphate	

Modifiers

Table 1358: Properties of each modifier.

Id	Name	SBO
e_0771	tktB	0000460
e_0928	tktA	0000460
s_0627	D-Fructose 6-phosphate	
s_0913	Glyceraldehyde 3-phosphate	
s_0621	D-Erythrose 4-phosphate	
s_0721	D-Xylulose 5-phosphate	

Products

Table 1359: Properties of each product.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_0721	D-Xylulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{339} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0627}] \cdot [\text{s\_0913}] - \frac{[\text{s\_0621}] \cdot [\text{s\_0721}]}{\text{Keq}} \right)}{\text{Km0627} \cdot \text{Km0913}}}{\left(1 + \frac{[\text{s\_0627}]}{\text{Km0627}}\right) \cdot \left(1 + \frac{[\text{s\_0913}]}{\text{Km0913}}\right) + \left(1 + \frac{[\text{s\_0621}]}{\text{Km0621}}\right) \cdot \left(1 + \frac{[\text{s\_0721}]}{\text{Km0721}}\right) - 1} \tag{679}$$

Table 1360: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.080	dimensionless	☑
Vmax		0000324	1.119	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0627		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0913		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0621		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0721		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.340 Reaction r_1363

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name triose-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0913} \xrightleftharpoons{\text{e\_1226, s\_0913, s\_0772}} \text{s\_0772} \tag{680}$$

Reactant

Table 1361: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	

Modifiers

Table 1362: Properties of each modifier.

Id	Name	SBO
e_1226	tpiA	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_0772	Dihydroxyacetone phosphate	

Product

Table 1363: Properties of each product.

Id	Name	SBO
s_0772	Dihydroxyacetone phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{340} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0913}] - \frac{[\mathrm{s\_0772}]}{\mathrm{Keq}} \right)}{\mathrm{Km0913}}}{1 + \frac{[\mathrm{s\_0913}]}{\mathrm{Km0913}} + 1 + \frac{[\mathrm{s\_0772}]}{\mathrm{Km0772}} - 1} \tag{681}$$

Table 1364: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.020	dimensionless	☑
Vmax		0000324	0.117	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0913		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0772		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.341 Reaction r_1367

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name tryptophan synthase (indoleglycerol phosphate)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0493} \xrightleftharpoons{\text{e\_0425, e\_0426, s\_0493, s\_0913, s\_1009}} \text{s\_0913} + \text{s\_1009} \tag{682}$$

Reactant

Table 1365: Properties of each reactant.

Id	Name	SBO
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	

Modifiers

Table 1366: Properties of each modifier.

Id	Name	SBO
e_0425	trpA	0000460
e_0426	trpB	0000460
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	
s_0913	Glyceraldehyde 3-phosphate	
s_1009	Indole	

Products

Table 1367: Properties of each product.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1009	Indole	

Kinetic Law

Derived unit contains undeclared units

$$v_{341} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0493}] - \frac{[\text{s\_0913}] \cdot [\text{s\_1009}]}{\text{Keq}} \right)}{\text{Km0493}}}{1 + \frac{[\text{s\_0493}]}{\text{Km0493}} + \left(1 + \frac{[\text{s\_0913}]}{\text{Km0913}}\right) \cdot \left(1 + \frac{[\text{s\_1009}]}{\text{Km1009}}\right) - 1} \tag{683}$$

Table 1368: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	☑
Vmax		0000324	0.079	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0493		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0913		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1009		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.342 Reaction r_1368

This is a reversible reaction of three reactants forming one product influenced by five modifiers.

Name Tryptophanase (L-tryptophan)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1009} + \text{s\_0451} + \text{s\_1531} \xrightleftharpoons{\text{e\_1141, s\_1009, s\_0451, s\_1531, s\_1185}} \text{s\_1185} \tag{684}$$

Reactants

Table 1369: Properties of each reactant.

Id	Name	SBO
s_1009	Indole	
s_0451	Ammonium	
s_1531	Pyruvate	

Modifiers

Table 1370: Properties of each modifier.

Id	Name	SBO
e_1141	tnaA	0000460

Id	Name	SBO
s_1009	Indole	
s_0451	Ammonium	
s_1531	Pyruvate	
s_1185	L-Tryptophan	

Product

Table 1371: Properties of each product.

Id	Name	SBO
s_1185	L-Tryptophan	

Kinetic Law

Derived unit contains undeclared units

$$v_{342} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1009}] \cdot [\text{s\_0451}] \cdot [\text{s\_1531}] - \frac{[\text{s\_1185}]}{\text{Keq}} \right)}{\text{Km1009} \cdot \text{Km0451} \cdot \text{Km1531}}}{\left(1 + \frac{[\text{s\_1009}]}{\text{Km1009}}\right) \cdot \left(1 + \frac{[\text{s\_0451}]}{\text{Km0451}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) + 1 + \frac{[\text{s\_1185}]}{\text{Km1185}} - 1} \tag{685}$$

Table 1372: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	☑
Vmax		0000324	0.142	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	200.000	$\text{mmol}^{-2} \cdot \text{l}^{2}$	☑
Km1009		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0451		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1185		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.343 Reaction r_1375

This is a reversible reaction of three reactants forming five products influenced by nine modifiers.

Name tyrosine lyase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1552} + \text{s\_1336} + \text{s\_1189} \xrightleftharpoons{\text{e\_1251, s\_1552, s\_1336, s\_1189, s\_1407, s\_0333, s\_0738, s\_1141, s\_1335}} \text{s\_1407} + \text{s\_0333}$$

(686)

Reactants

Table 1373: Properties of each reactant.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1189	L-Tyrosine	

Modifiers

Table 1374: Properties of each modifier.

Id	Name	SBO
e_1251	thiG	0000460
s_1552	S-Adenosyl-L-methionine	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1189	L-Tyrosine	
s_1407	p-Cresol	
s_0333	5'-Deoxyadenosine	
s_0738	dehydroglycine	
s_1141	L-Methionine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 1375: Properties of each product.

Id	Name	SBO
s_1407	p-Cresol	
s_0333	5'-Deoxyadenosine	
s_0738	dehydroglycine	
s_1141	L-Methionine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{343} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1552}] \cdot [\text{s\_1336}] \cdot [\text{s\_1189}] - \frac{[\text{s\_1407}] \cdot [\text{s\_0333}] \cdot [\text{s\_0738}] \cdot [\text{s\_1141}] \cdot [\text{s\_1335}]}{\text{Keq}} \right)}{\text{Km1552} \cdot \text{Km1336} \cdot \text{Km1189}}}{\left(1 + \frac{[\text{s\_1552}]}{\text{Km1552}}\right) \cdot \left(1 + \frac{[\text{s\_1336}]}{\text{Km1336}}\right) \cdot \left(1 + \frac{[\text{s\_1189}]}{\text{Km1189}}\right) + \left(1 + \frac{[\text{s\_1407}]}{\text{Km1407}}\right) \cdot \left(1 + \frac{[\text{s\_0333}]}{\text{Km0333}}\right) \cdot \left(1 + \frac{[\text{s\_0738}]}{\text{Km0738}}\right) \cdot \left(1 + \frac{[\text{s\_1141}]}{\text{Km1141}}\right) \cdot} \quad (687)$$

Table 1376: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	☑
Km1552		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1189		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1407		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0738		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1141		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.344 Reaction r_1376

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name tyrosine transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0262} + \text{s\_1095} \xrightleftharpoons{\text{e\_1276, e\_0332, s\_0262, s\_1095, s\_0233, s\_1189}} \text{s\_0233} + \text{s\_1189} \quad (688)$$

Reactants

Table 1377: Properties of each reactant.

Id	Name	SBO
s_0262	3-(4-Hydroxyphenyl)pyruvate	

Id	Name	SBO
s_1095	L-Glutamate	

Modifiers

Table 1378: Properties of each modifier.

Id	Name	SBO
e_1276	tyrB	0000460
e_0332	aspC	0000460
s_0262	3-(4-Hydroxyphenyl)pyruvate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1189	L-Tyrosine	

Products

Table 1379: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1189	L-Tyrosine	

Kinetic Law

Derived unit contains undeclared units

$$v_{344} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0262}] \cdot [\mathrm{s\_1095}] - \frac{[\mathrm{s\_0233}] \cdot [\mathrm{s\_1189}]}{\mathrm{Keq}} \right)}{\mathrm{Km0262} \cdot \mathrm{Km1095}}}{\left(1 + \frac{[\mathrm{s\_0262}]}{\mathrm{Km0262}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) + \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1189}]}{\mathrm{Km1189}}\right) - 1} \tag{689}$$

Table 1380: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.019	dimensionless	☑
Vmax		0000324	0.268	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0262		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1095		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0233		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1189		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.345 Reaction r_1378

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-3-O-(3-hydroxymyristoyl)glucosamine acyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0028} + \text{s\_1735} \xrightleftharpoons{\text{e\_0081, s\_0028, s\_1735, s\_0397, s\_1734}} \text{s\_0397} + \text{s\_1734} \tag{690}$$

Reactants

Table 1381: Properties of each reactant.

Id	Name	SBO
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	

Modifiers

Table 1382: Properties of each modifier.

Id	Name	SBO
e_0081	lpxD	0000460
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	
s_0397	acyl carrier protein	
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Products

Table 1383: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{345} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0028}] \cdot [\mathrm{s\_1735}] - \frac{[\mathrm{s\_0397}] \cdot [\mathrm{s\_1734}]}{\mathrm{Keq}} \right)}{\mathrm{Km0028} \cdot \mathrm{Km1735}}}{\left(1 + \frac{[\mathrm{s\_0028}]}{\mathrm{Km0028}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1735}]}{\mathrm{Km1735}}\right) + \left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1734}]}{\mathrm{Km1734}}\right) - 1} \tag{691}$$

Table 1384: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	☑
Vmax		0000324	0.075	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0028		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1735		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0397		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1734		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.346 Reaction r_1379

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name UDP-3-O-acetylglucosamine deacetylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1736} \xrightleftharpoons{\mathrm{e\_0044,\ s\_1736,\ s\_0384,\ s\_1735}} \mathrm{s\_0384} + \mathrm{s\_1735} \tag{692}$$

Reactant

Table 1385: Properties of each reactant.

Id	Name	SBO
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Modifiers

Table 1386: Properties of each modifier.

Id	Name	SBO
e_0044	lpxC	0000460
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Id	Name	SBO
s_0384	Acetate	
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	

Products

Table 1387: Properties of each product.

Id	Name	SBO
s_0384	Acetate	
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{346} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1736}] - \frac{[\text{s\_0384}] \cdot [\text{s\_1735}]}{\text{Keq}} \right)}{\text{Km1736}}}{1 + \frac{[\text{s\_1736}]}{\text{Km1736}} + \left(1 + \frac{[\text{s\_0384}]}{\text{Km0384}}\right) \cdot \left(1 + \frac{[\text{s\_1735}]}{\text{Km1735}}\right) - 1} \tag{693}$$

Table 1388: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	☑
Vmax		0000324	0.054	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1736		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0384		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1735		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.347 Reaction r_1388

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylenolpyruvoylglucosamine reductase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1336} + \text{s\_1742} \xrightleftharpoons{\text{e\_1248, s\_1336, s\_1742, s\_1335, s\_1750}} \text{s\_1335} + \text{s\_1750} \tag{694}$$

Reactants

Table 1389: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	

Modifiers

Table 1390: Properties of each modifier.

Id	Name	SBO
e_1248	murB	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1750	UDP-N-acetylmuramate	

Products

Table 1391: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1750	UDP-N-acetylmuramate	

Kinetic Law

Derived unit contains undeclared units

$$v_{347} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1336}] \cdot [\mathrm{s\_1742}] - \frac{[\mathrm{s\_1335}] \cdot [\mathrm{s\_1750}]}{\mathrm{Keq}} \right)}{\mathrm{Km1336} \cdot \mathrm{Km1742}}}{\left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1742}]}{\mathrm{Km1742}}\right) + \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1750}]}{\mathrm{Km1750}}\right) - 1} \tag{695}$$

Table 1392: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.054	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km1336		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1742		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1750		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.348 Reaction r_1389

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylglucosamine 1-carboxyvinyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1484} + \mathrm{s\_1745} \xrightleftharpoons{\mathrm{e\_0991},\ \mathrm{s\_1484},\ \mathrm{s\_1745},\ \mathrm{s\_1430},\ \mathrm{s\_1742}} \mathrm{s\_1430} + \mathrm{s\_1742} \tag{696}$$

Reactants

Table 1393: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_1745	UDP-N-acetyl-D-glucosamine	

Modifiers

Table 1394: Properties of each modifier.

Id	Name	SBO
e_0991	murA	0000460
s_1484	Phosphoenolpyruvate	
s_1745	UDP-N-acetyl-D-glucosamine	
s_1430	Phosphate	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	

Products

Table 1395: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{348} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1484}] \cdot [\text{s\_1745}] - \frac{[\text{s\_1430}] \cdot [\text{s\_1742}]}{\text{Keq}} \right)}{\text{Km1484} \cdot \text{Km1745}}}{\left(1 + \frac{[\text{s\_1484}]}{\text{Km1484}}\right) \cdot \left(1 + \frac{[\text{s\_1745}]}{\text{Km1745}}\right) + \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) \cdot \left(1 + \frac{[\text{s\_1742}]}{\text{Km1742}}\right) - 1} \tag{697}$$

Table 1396: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.054	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1484		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1745		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1742		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.349 Reaction r_1391

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name UDP-N-acetylglucosamine acyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0028} + \text{s\_1745} \xrightleftharpoons{\text{e\_0375, e\_0083, s\_0028, s\_1745, s\_0397, s\_1736}} \text{s\_0397} + \text{s\_1736} \tag{698}$$

Reactants

Table 1397: Properties of each reactant.

Id	Name	SBO
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1745	UDP-N-acetyl-D-glucosamine	

Modifiers

Table 1398: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0083	lpxA	0000460
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1745	UDP-N-acetyl-D-glucosamine	
s_0397	acyl carrier protein	
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Products

Table 1399: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{349} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0028}] \cdot [\mathrm{s\_1745}] - \frac{[\mathrm{s\_0397}] \cdot [\mathrm{s\_1736}]}{\mathrm{Keq}} \right)}{\mathrm{Km0028} \cdot \mathrm{Km1745}}}{\left(1 + \frac{[\mathrm{s\_0028}]}{\mathrm{Km0028}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1745}]}{\mathrm{Km1745}}\right) + \left(1 + \frac{[\mathrm{s\_0397}]}{\mathrm{Km0397}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1736}]}{\mathrm{Km1736}}\right) - 1} \tag{699}$$

Table 1400: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	☑
Vmax		0000324	0.075	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
Km0028		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1745		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0397		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1736		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.350 Reaction r_1392

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylglucosamine diphosphorylase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1287} + \mathrm{s\_1792} \xrightleftharpoons{\mathrm{e\_1150},\ \mathrm{s\_1287},\ \mathrm{s\_1792},\ \mathrm{s\_0783},\ \mathrm{s\_1745}} \mathrm{s\_0783} + \mathrm{s\_1745} \qquad (700)$$

Reactants

Table 1401: Properties of each reactant.

Id	Name	SBO
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_1792	UTP	

Modifiers

Table 1402: Properties of each modifier.

Id	Name	SBO
e_1150	glmU	0000460
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_1792	UTP	
s_0783	Diphosphate	
s_1745	UDP-N-acetyl-D-glucosamine	

Products

Table 1403: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1745	UDP-N-acetyl-D-glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{350} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1287}] \cdot [\text{s\_1792}] - \frac{[\text{s\_0783}] \cdot [\text{s\_1745}]}{\text{Keq}} \right)}{\text{Km1287} \cdot \text{Km1792}}}{\left(1 + \frac{[\text{s\_1287}]}{\text{Km1287}}\right) \cdot \left(1 + \frac{[\text{s\_1792}]}{\text{Km1792}}\right) + \left(1 + \frac{[\text{s\_0783}]}{\text{Km0783}}\right) \cdot \left(1 + \frac{[\text{s\_1745}]}{\text{Km1745}}\right) - 1} \tag{701}$$

Table 1404: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	☑
Vmax		0000324	0.183	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1287		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1792		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1745		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.351 Reaction r_1393

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylglucosamine-N-acetylmuramyl-(pentapeptide)pyrophosphoryl-undecaprenol N-acetylglucosamine transferase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1745} + \text{s\_1777} \xrightleftharpoons{\text{e\_0041, s\_1745, s\_1777, s\_1776, s\_1733}} \text{s\_1776} + \text{s\_1733} \tag{702}$$

Reactants

Table 1405: Properties of each reactant.

Id	Name
s_1745	UDP-N-acetyl-D-glucosamine
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-

Modifiers

Table 1406: Properties of each modifier.

Id	Name
e_0041	murG
s_1745	UDP-N-acetyl-D-glucosamine
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim
s_1733	UDP

Products

Table 1407: Properties of each product.

Id	Name
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim
s_1733	UDP

Kinetic Law

Derived unit contains undeclared units

$$v_{351} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1745}] \cdot [\mathrm{s\_1777}] - \frac{[\mathrm{s\_1776}] \cdot [\mathrm{s\_1733}]}{\mathrm{Keq}} \right)}{\mathrm{Km1745} \cdot \mathrm{Km1777}}}{\left(1 + \frac{[\mathrm{s\_1745}]}{\mathrm{Km1745}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1777}]}{\mathrm{Km1777}}\right) + \left(1 + \frac{[\mathrm{s\_1776}]}{\mathrm{Km1776}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1733}]}{\mathrm{Km1733}}\right) - 1} \tag{703}$$

Table 1408: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.054	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1745		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1777		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1776		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1733		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.352 Reaction r_1397

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanine synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1041} + \mathrm{s\_0467} + \mathrm{s\_1750} \xrightleftharpoons{\mathrm{e\_0042},\ \mathrm{s\_1041},\ \mathrm{s\_0467},\ \mathrm{s\_1750},\ \mathrm{s\_0421},\ \mathrm{s\_1430},\ \mathrm{s\_1751}} \mathrm{s\_0421} + \mathrm{s\_1430} + \mathrm{s\_1751} \quad (704)$$

Reactants

Table 1409: Properties of each reactant.

Id	Name	SBO
s_1041	L-Alanine	
s_0467	ATP	
s_1750	UDP-N-acetylmuramate	

Modifiers

Table 1410: Properties of each modifier.

Id	Name	SBO
e_0042	murC	0000460
s_1041	L-Alanine	
s_0467	ATP	
s_1750	UDP-N-acetylmuramate	
s_0421	ADP	
s_1430	Phosphate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	

Products

Table 1411: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{352} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1041}] \cdot [\mathrm{s\_0467}] \cdot [\mathrm{s\_1750}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_1430}] \cdot [\mathrm{s\_1751}]}{\mathrm{Keq}} \right)}{\mathrm{Km1041} \cdot \mathrm{Km0467} \cdot \mathrm{Km1750}}}{\left(1 + \frac{[\mathrm{s\_1041}]}{\mathrm{Km1041}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1750}]}{\mathrm{Km1750}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1751}]}{\mathrm{Km1751}}\right) - 1} \tag{705}$$

Table 1412: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.115	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1041		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1750		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1751		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.353 Reaction r_1399

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamate synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0467} + \text{s\_0671} + \text{s\_1751} \xrightleftharpoons{\text{e\_0040, s\_0467, s\_0671, s\_1751, s\_0421, s\_1430, s\_1754}} \text{s\_0421} + \text{s\_1430} + \text{s\_1754} \quad (706)$$

Reactants

Table 1413: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0671	D-Glutamate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	

Modifiers

Table 1414: Properties of each modifier.

Id	Name	SBO
e_0040	murD	0000460
s_0467	ATP	
s_0671	D-Glutamate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	
s_0421	ADP	
s_1430	Phosphate	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	

Products

Table 1415: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{353} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_0671}] \cdot [\text{s\_1751}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1430}] \cdot [\text{s\_1754}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km0671} \cdot \text{Km1751}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_0671}]}{\text{Km0671}}\right) \cdot \left(1 + \frac{[\text{s\_1751}]}{\text{Km1751}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) \cdot \left(1 + \frac{[\text{s\_1754}]}{\text{Km1754}}\right) - 1} \tag{707}$$

Table 1416: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.115	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0671		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1751		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1754		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.354 Reaction r_1400

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimelate synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1242} + \text{s\_0467} + \text{s\_1754} \xrightleftharpoons{\text{e\_0037, s\_1242, s\_0467, s\_1754, s\_0421, s\_1430, s\_1752}} \text{s\_0421} + \text{s\_1430} + \text{s\_1752} \tag{708}$$

Reactants

Table 1417: Properties of each reactant.

Id	Name	SBO
s_1242	meso-2,6-Diaminoheptanedioate	
s_0467	ATP	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	

Modifiers

Table 1418: Properties of each modifier.

Id	Name	SBO
e_0037	murE	0000460
s_1242	meso-2,6-Diaminoheptanedioate	
s_0467	ATP	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	
s_0421	ADP	
s_1430	Phosphate	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	

Products

Table 1419: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	

Kinetic Law

Derived unit contains undeclared units

$$v_{354} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1242}] \cdot [\text{s\_0467}] \cdot [\text{s\_1754}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1430}] \cdot [\text{s\_1752}]}{\text{Keq}} \right)}{\text{Km1242} \cdot \text{Km0467} \cdot \text{Km1754}}}{\left(1 + \frac{[\text{s\_1242}]}{\text{Km1242}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1754}]}{\text{Km1754}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) \cdot \left(1 + \frac{[\text{s\_1752}]}{\text{Km1752}}\right) - 1} \tag{709}$$

Table 1420: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.115	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1242		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1754		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1752		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.355 Reaction r_1401

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine synthetase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0603} + \mathrm{s\_0467} + \mathrm{s\_1752} \xrightleftharpoons{\mathrm{e\_0038},\ \mathrm{s\_0603},\ \mathrm{s\_0467},\ \mathrm{s\_1752},\ \mathrm{s\_0421},\ \mathrm{s\_1430},\ \mathrm{s\_1755}} \mathrm{s\_0421} + \mathrm{s\_1430} + \mathrm{s\_1755} \quad (710)$$

Reactants

Table 1421: Properties of each reactant.

Id	Name	SBO
s_0603	D-Alanyl-D-alanine	
s_0467	ATP	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	

Modifiers

Table 1422: Properties of each modifier.

Id	Name	SBO
e_0038	murF	000046
s_0603	D-Alanyl-D-alanine	
s_0467	ATP	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	
s_0421	ADP	
s_1430	Phosphate	
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	

Products

Table 1423: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{355} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0603}] \cdot [\mathrm{s\_0467}] \cdot [\mathrm{s\_1752}] - \frac{[\mathrm{s\_0421}] \cdot [\mathrm{s\_1430}] \cdot [\mathrm{s\_1755}]}{\mathrm{Keq}} \right)}{\mathrm{Km0603} \cdot \mathrm{Km0467} \cdot \mathrm{Km1752}}}{\left(1 + \frac{[\mathrm{s\_0603}]}{\mathrm{Km0603}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1752}]}{\mathrm{Km1752}}\right) + \left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1755}]}{\mathrm{Km1755}}\right) - 1} \tag{711}$$

Table 1424: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.115	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0603		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0467		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1752		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0421		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1430		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1755		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.356 Reaction r_1402

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name UDP-sugar hydrolase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1734} \xrightleftharpoons{\mathrm{e\_0186,\ s\_1734,\ s\_0149,\ s\_1762}} \mathrm{s\_0149} + \mathrm{s\_1762} \tag{712}$$

Reactant

Table 1425: Properties of each reactant.

Id	Name	SBO
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Modifiers

Table 1426: Properties of each modifier.

Id	Name	SBO
e_0186	lpxH	0000460
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1762	UMP	

Products

Table 1427: Properties of each product.

Id	Name	SBO
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1762	UMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{356} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1734}] - \frac{[\mathrm{s\_0149}] \cdot [\mathrm{s\_1762}]}{\mathrm{Keq}} \right)}{\mathrm{Km1734}}}{1 + \frac{[\mathrm{s\_1734}]}{\mathrm{Km1734}} + \left(1 + \frac{[\mathrm{s\_0149}]}{\mathrm{Km0149}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1762}]}{\mathrm{Km1762}}\right) - 1} \tag{713}$$

Table 1428: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	☑
Vmax		0000324	0.027	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	0.200	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1734		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Km0149		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1762		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.357 Reaction r_1409

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name UMP kinase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0467} + \mathrm{s\_1762} \xrightleftharpoons{\mathrm{e\_0328},\ \mathrm{e\_0077},\ \mathrm{s\_0467},\ \mathrm{s\_1762},\ \mathrm{s\_0421},\ \mathrm{s\_1733}} \mathrm{s\_0421} + \mathrm{s\_1733} \qquad (714)$$

Reactants

Table 1429: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1762	UMP	

Modifiers

Table 1430: Properties of each modifier.

Id	Name	SBO
e_0328	cmk	0000460
e_0077	pyrH	0000460
s_0467	ATP	
s_1762	UMP	
s_0421	ADP	
s_1733	UDP	

Products

Table 1431: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1733	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{357} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0467}] \cdot [\text{s\_1762}] - \frac{[\text{s\_0421}] \cdot [\text{s\_1733}]}{\text{Keq}} \right)}{\text{Km0467} \cdot \text{Km1762}}}{\left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right) \cdot \left(1 + \frac{[\text{s\_1762}]}{\text{Km1762}}\right) + \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right) \cdot \left(1 + \frac{[\text{s\_1733}]}{\text{Km1733}}\right) - 1} \tag{715}$$

Table 1432: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.052	dimensionless	☑
Vmax		0000324	0.733	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1762		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1733		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.358 Reaction r_1410

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Undecaprenyl diphosphate synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0826} + 8\,\text{s\_1028} \xrightleftharpoons{\text{e\_0079, s\_0826, s\_1028, s\_0783, s\_1765}} 8\,\text{s\_0783} + \text{s\_1765} \tag{716}$$

Reactants

Table 1433: Properties of each reactant.

Id	Name	SBO
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 1434: Properties of each modifier.

Id	Name	SBO
e_0079	uppS	0000460
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0783	Diphosphate	
s_1765	Undecaprenyl diphosphate	

Products

Table 1435: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1765	Undecaprenyl diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{358} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0826}] \cdot [\mathrm{s\_1028}]^8 - \frac{[\mathrm{s\_0783}]^8 \cdot [\mathrm{s\_1765}]}{\mathrm{Keq}} \right)}{\mathrm{Km0826} \cdot \mathrm{Km1028}^8}}{\left(1 + \frac{[\mathrm{s\_0826}]}{\mathrm{Km0826}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1028}]}{\mathrm{Km1028}}\right)^8 + \left(1 + \frac{[\mathrm{s\_0783}]}{\mathrm{Km0783}}\right)^8 \cdot \left(1 + \frac{[\mathrm{s\_1765}]}{\mathrm{Km1765}}\right) - 1} \quad (717)$$

Table 1436: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.61842038009631 \cdot 10^{-6}$	dimensionless	☑
Vmax		0000324	0.016	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0826		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

Id	Name	SBO	Value	Unit	Constant
Km1028		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0783		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1765		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.359 Reaction r_1413

This is a reversible reaction of one reactant forming two products influenced by six modifiers.

Name undecaprenyl-diphosphatase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1765} \xrightleftharpoons{\mathrm{e\_0962,\ e\_0433,\ e\_0300,\ s\_1765,\ s\_1430,\ s\_1768}} \mathrm{s\_1430} + \mathrm{s\_1768} \qquad (718)$$

Reactant

Table 1437: Properties of each reactant.

Id	Name	SBO
s_1765	Undecaprenyl diphosphate	

Modifiers

Table 1438: Properties of each modifier.

Id	Name	SBO
e_0962	uppP	0000460
e_0433	pgpB	0000460
e_0300	ybjG	0000460
s_1765	Undecaprenyl diphosphate	
s_1430	Phosphate	
s_1768	Undecaprenyl phosphate	

Products

Table 1439: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1768	Undecaprenyl phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{359} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1765}] - \frac{[\text{s\_1430}] \cdot [\text{s\_1768}]}{\text{Keq}} \right)}{\text{Km1765}}}{1 + \frac{[\text{s\_1765}]}{\text{Km1765}} + \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) \cdot \left(1 + \frac{[\text{s\_1768}]}{\text{Km1768}}\right) - 1} \tag{719}$$

Table 1440: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	☑
Vmax		0000324	0.038	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1765		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1768		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.360 Reaction r_1421

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name uroporphyrinogen decarboxylase (uroporphyrinogen III)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1791} \xrightleftharpoons{\text{e\_1256, s\_1791, s\_0543, s\_0565}} 4\,\text{s\_0543} + \text{s\_0565} \tag{720}$$

Reactant

Table 1441: Properties of each reactant.

Id	Name	SBO
s_1791	Uroporphyrinogen III	

Id	Name	SBO

Modifiers

Table 1442: Properties of each modifier.

Id	Name	SBO
e_1256	hemE	0000460
s_1791	Uroporphyrinogen III	
s_0543	CO2	
s_0565	Coproporphyrinogen III	

Products

Table 1443: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_0565	Coproporphyrinogen III	

Kinetic Law

Derived unit contains undeclared units

$$v_{360} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1791}] - \frac{[\mathrm{s\_0543}]^4 \cdot [\mathrm{s\_0565}]}{\mathrm{Keq}} \right)}{\mathrm{Km1791}}}{1 + \frac{[\mathrm{s\_1791}]}{\mathrm{Km1791}} + \left(1 + \frac{[\mathrm{s\_0543}]}{\mathrm{Km0543}}\right)^4 \cdot \left(1 + \frac{[\mathrm{s\_0565}]}{\mathrm{Km0565}}\right) - 1} \tag{721}$$

Table 1444: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317225085 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.002	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	$2 \cdot 10^{-4}$	$\mathrm{mmol}^4 \cdot \mathrm{l}^{-4}$	☑
Km1791		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0543		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0565		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.361 Reaction r_1422

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name uroporphyrinogen methyltransferase

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\mathrm{s\_1552} + \mathrm{s\_1791} \xrightleftharpoons{\mathrm{e\_1184},\ \mathrm{e\_1019},\ \mathrm{s\_1552},\ \mathrm{s\_1791},\ \mathrm{s\_1551},\ \mathrm{s\_0768}} 2\,\mathrm{s\_1551} + \mathrm{s\_0768} \quad (722)$$

Reactants

Table 1445: Properties of each reactant.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1791	Uroporphyrinogen III	

Modifiers

Table 1446: Properties of each modifier.

Id	Name	SBO
e_1184	hemX	0000460
e_1019	cysG	0000460
s_1552	S-Adenosyl-L-methionine	
s_1791	Uroporphyrinogen III	
s_1551	S-Adenosyl-L-homocysteine	
s_0768	dihydrosirohydrochlorin	

Products

Table 1447: Properties of each product.

Id	Name	SBO
s_1551	S-Adenosyl-L-homocysteine	
s_0768	dihydrosirohydrochlorin	

Kinetic Law

Derived unit contains undeclared units

$$v_{361} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1552}]^2 \cdot [\text{s\_1791}] - \frac{[\text{s\_1551}]^2 \cdot [\text{s\_0768}]}{\text{Keq}} \right)}{\text{Km1552}^2 \cdot \text{Km1791}}}{\left(1 + \frac{[\text{s\_1552}]}{\text{Km1552}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1791}]}{\text{Km1791}}\right) + \left(1 + \frac{[\text{s\_1551}]}{\text{Km1551}}\right)^2 \cdot \left(1 + \frac{[\text{s\_0768}]}{\text{Km0768}}\right) - 1} \quad (723)$$

Table 1448: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$9.26676951688089 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1552		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1791		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1551		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0768		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.362 Reaction r_1423

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name uroporphyrinogen-III synthase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0998} \xrightleftharpoons{\text{e\_1185, s\_0998, s\_1791}} \text{s\_1791} \quad (724)$$

Reactant

Table 1449: Properties of each reactant.

Id	Name	SBO
s_0998	Hydroxymethylbilane	

Modifiers

Table 1450: Properties of each modifier.

Id	Name	SBO
e_1185	hemD	0000460
s_0998	Hydroxymethylbilane	
s_1791	Uroporphyrinogen III	

Product

Table 1451: Properties of each product.

Id	Name	SBO
s_1791	Uroporphyrinogen III	

Kinetic Law

Derived unit contains undeclared units

$$v_{362} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0998}] - \frac{[\text{s\_1791}]}{\text{Keq}} \right)}{\text{Km0998}}}{1 + \frac{[\text{s\_0998}]}{\text{Km0998}} + 1 + \frac{[\text{s\_1791}]}{\text{Km1791}} - 1} \tag{725}$$

Table 1452: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.1778463445417 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.70670780672502 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0998		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1791		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.363 Reaction r_1425

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name valine transaminase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0282} + \text{s\_1095} \xrightleftharpoons{\text{e\_1167, s\_0282, s\_1095, s\_0233, s\_1193}} \text{s\_0233} + \text{s\_1193} \tag{726}$$

Reactants

Table 1453: Properties of each reactant.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	
s_1095	L-Glutamate	

Modifiers

Table 1454: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
s_0282	3-Methyl-2-oxobutanoate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1193	L-Valine	

Products

Table 1455: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1193	L-Valine	

Kinetic Law

Derived unit contains undeclared units

$$v_{363} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0282}] \cdot [\mathrm{s\_1095}] - \frac{[\mathrm{s\_0233}] \cdot [\mathrm{s\_1193}]}{\mathrm{Keq}} \right)}{\mathrm{Km0282} \cdot \mathrm{Km1095}}}{\left(1 + \frac{[\mathrm{s\_0282}]}{\mathrm{Km0282}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1095}]}{\mathrm{Km1095}}\right) + \left(1 + \frac{[\mathrm{s\_0233}]}{\mathrm{Km0233}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1193}]}{\mathrm{Km1193}}\right) - 1} \tag{727}$$

Table 1456: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.059	dimensionless	☑
Vmax		0000324	0.821	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	☑
Km0282		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1095		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0233		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1193		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.364 Reaction r_1432

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name xylose isomerase

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0657} \xrightleftharpoons{\mathrm{e\_1086},\ \mathrm{s\_0657},\ \mathrm{s\_0622}} \mathrm{s\_0622} \tag{728}$$

Reactant

Table 1457: Properties of each reactant.

Id	Name	SBO
s_0657	D-Glucose	

Modifiers

Table 1458: Properties of each modifier.

Id	Name	SBO
e_1086	xylA	0000460
s_0657	D-Glucose	
s_0622	D-Fructose	

Product

Table 1459: Properties of each product.

Id	Name	SBO
s_0622	D-Fructose	

Kinetic Law

Derived unit contains undeclared units

$$v_{364} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0657}] - \frac{[\text{s\_0622}]}{\text{Keq}} \right)}{\text{Km0657}}}{1 + \frac{[\text{s\_0657}]}{\text{Km0657}} + 1 + \frac{[\text{s\_0622}]}{\text{Km0622}} - 1} \tag{729}$$

Table 1460: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.066	dimensionless	☑
Vmax		0000324	0.394	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km0657		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0622		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.365 Reaction r_1511

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name ammonia transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0453} \overset{\text{s\_0453, s\_0451}}{\rightleftharpoons} \text{s\_0451} \tag{730}$$

Reactant

Table 1461: Properties of each reactant.

Id	Name	SBO
s_0453	Ammonium	

Modifiers

Table 1462: Properties of each modifier.

Id	Name	SBO
s_0453	Ammonium	

Id	Name	SBO
s_0451	Ammonium	

Product

Table 1463: Properties of each product.

Id	Name	SBO
s_0451	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{365} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_0453]} - \text{[s\_0451]})}{\text{Km0453}}}{1 + \frac{\text{[s\_0453]}}{\text{Km0453}} + 1 + \frac{\text{[s\_0451]}}{\text{Km0451}} - 1} \tag{731}$$

Table 1464: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.493	dimensionless	☑
Vmax		0000324	4.976	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0453		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0451		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.366 Reaction r_1521

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name ATP synthase (four protons for one ATP) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0421} + \text{s\_1430} \overset{\text{s\_0421, s\_1430, s\_0467}}{\rightleftharpoons} \text{s\_0467} \tag{732}$$

Reactants

Table 1465: Properties of each reactant.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	

Modifiers

Table 1466: Properties of each modifier.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_0467	ATP	

Product

Table 1467: Properties of each product.

Id	Name	SBO
s_0467	ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{366} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0421}] \cdot [\mathrm{s\_1430}] - \frac{[\mathrm{s\_0467}]}{\mathrm{Keq}} \right)}{\mathrm{Km0421} \cdot \mathrm{Km1430}}}{\left(1 + \frac{[\mathrm{s\_0421}]}{\mathrm{Km0421}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) + 1 + \frac{[\mathrm{s\_0467}]}{\mathrm{Km0467}} - 1} \tag{733}$$

Table 1468: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			12.851	dimensionless	☑
Vmax		0000324	128.512	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	20.000	$\mathrm{mmol}^{-1} \cdot \mathrm{l}$	☑
Km0421		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0467		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.367 Reaction r_1536

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name calcium (Ca+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0499} \xrightleftharpoons{\text{s\_0499, s\_0497}} \text{s\_0497} \tag{734}$$

Reactant

Table 1469: Properties of each reactant.

Id	Name	SBO
s_0499	Calcium	

Modifiers

Table 1470: Properties of each modifier.

Id	Name	SBO
s_0499	Calcium	
s_0497	Calcium	

Product

Table 1471: Properties of each product.

Id	Name	SBO
s_0497	Calcium	

Kinetic Law

Derived unit contains undeclared units

$$v_{367} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_0499]} - \text{[s\_0497]})}{\text{Km0499}}}{1 + \frac{\text{[s\_0499]}}{\text{Km0499}} + 1 + \frac{\text{[s\_0497]}}{\text{Km0497}} - 1} \tag{735}$$

Table 1472: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.20979601425486 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.002	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Km0499		0000322	1.000	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0497		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.368 Reaction r_1543

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name chloride (Cl-1) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\mathrm{s\_0522} \xrightleftharpoons{\mathrm{s\_0522},\ \mathrm{s\_0520}} \mathrm{s\_0520} \tag{736}$$

Reactant

Table 1473: Properties of each reactant.

Id	Name	SBO
s_0522	Chloride	

Modifiers

Table 1474: Properties of each modifier.

Id	Name	SBO
s_0522	Chloride	
s_0520	Chloride	

Product

Table 1475: Properties of each product.

Id	Name	SBO
s_0520	Chloride	

Kinetic Law

Derived unit contains undeclared units

$$v_{368} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s\_0522}] - [\text{s\_0520}])}{\text{Km0522}}}{1 + \frac{[\text{s\_0522}]}{\text{Km0522}} + 1 + \frac{[\text{s\_0520}]}{\text{Km0520}} - 1} \tag{737}$$

Table 1476: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.20979601425486 \cdot 10^{-4}$	dimensionless	☑
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0522		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0520		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.369 Reaction r_1551

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name CO2 transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0543} \xrightarrow{\text{s\_0543}} \text{s\_0545} \tag{738}$$

Reactant

Table 1477: Properties of each reactant.

Id	Name	SBO
s_0543	CO2	

Modifier

Table 1478: Properties of each modifier.

Id	Name	SBO
s_0543	CO2	

Product

Table 1479: Properties of each product.

Id	Name	SBO
s_0545	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{369} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot [\text{s\_0543}]}{\text{Km0543}}}{1 + \frac{[\text{s\_0543}]}{\text{Km0543}}} \tag{739}$$

Table 1480: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.321	dimensionless	☑
Vmax		0000324	0.641	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0543		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.370 Reaction r_1557

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name cobalt (Co+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0548} \xrightleftharpoons{\text{s\_0548, s\_0546}} \text{s\_0546} \tag{740}$$

Reactant

Table 1481: Properties of each reactant.

Id	Name	SBO
s_0548	Co2+	

Modifiers

Table 1482: Properties of each modifier.

Id	Name	SBO
s_0548	Co2+	
s_0546	Co2+	

Product

Table 1483: Properties of each product.

Id	Name	SBO
s_0546	Co2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{370} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s\_0548}] - [\text{s\_0546}])}{\text{Km0548}}}{1 + \frac{[\text{s\_0548}]}{\text{Km0548}} + 1 + \frac{[\text{s\_0546}]}{\text{Km0546}} - 1} \tag{741}$$

Table 1484: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.46291835458927 \cdot 10^{-6}$	dimensionless	☑
Vmax		0000324	$1.15430611819642 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0548		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0546		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.371 Reaction r_1565

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name copper (Cu+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0581} \xrightleftharpoons{\text{s\_0581, s\_0579}} \text{s\_0579} \tag{742}$$

Reactant

Table 1485: Properties of each reactant.

Id	Name	SBO
s_0581	Cu2+	

Modifiers

Table 1486: Properties of each modifier.

Id	Name	SBO
s_0581	Cu2+	
s_0579	Cu2+	

Product

Table 1487: Properties of each product.

Id	Name	SBO
s_0579	Cu2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{371} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_0581]} - \text{[s\_0579]})}{\text{Km0581}}}{1 + \frac{\text{[s\_0581]}}{\text{Km0581}} + 1 + \frac{\text{[s\_0579]}}{\text{Km0579}} - 1} \tag{743}$$

Table 1488: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.82083645361517 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.27361215120506 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0581		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0579		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.372 Reaction r_1581

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name cytochrome oxidase bd (menaquinol-8: 2 protons) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1239} + 0{\cdot}5\,\mathrm{s\_1372} \xrightleftharpoons{\mathrm{s\_1239,\ s\_1372,\ s\_1240}} \mathrm{s\_1240} \tag{744}$$

Reactants

Table 1489: Properties of each reactant.

Id	Name	SBO
s_1239	Menaquinol 8	
s_1372	O2	

Modifiers

Table 1490: Properties of each modifier.

Id	Name	SBO
s_1239	Menaquinol 8	
s_1372	O2	
s_1240	Menaquinone 8	

Product

Table 1491: Properties of each product.

Id	Name	SBO
s_1240	Menaquinone 8	

Kinetic Law

Derived unit contains undeclared units

$$v_{372} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1239}] \cdot [\text{s\_1372}] - \frac{[\text{s\_1240}]}{\text{Keq}} \right)}{\text{Km1239} \cdot \text{Km1372}}}{\left(1 + \frac{[\text{s\_1239}]}{\text{Km1239}}\right) \cdot \left(1 + \frac{[\text{s\_1372}]}{\text{Km1372}}\right) + 1 + \frac{[\text{s\_1240}]}{\text{Km1240}} - 1} \tag{745}$$

Table 1492: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	☑
Vmax		0000324	0.230	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km1239		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1372		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1240		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.373 Reaction r_1582

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name cytochrome oxidase bd (ubiquinol-8: 2 protons) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation

$$0{\cdot}5\,\text{s\_1372} + \text{s\_1731} \xrightleftharpoons{\text{s\_1372, s\_1731, s\_1732}} \text{s\_1732} \tag{746}$$

Reactants

Table 1493: Properties of each reactant.

Id	Name	SBO
s_1372	O2	
s_1731	Ubiquinol-8	

Modifiers

Table 1494: Properties of each modifier.

Id	Name	SBO
s_1372	O2	
s_1731	Ubiquinol-8	

Id	Name	SBO
s_1732	Ubiquinone-8	

Product

Table 1495: Properties of each product.

Id	Name	SBO
s_1732	Ubiquinone-8	

Kinetic Law

Derived unit contains undeclared units

$$v_{373} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1372}] \cdot [\text{s\_1731}] - \frac{[\text{s\_1732}]}{\text{Keq}} \right)}{\text{Km1372} \cdot \text{Km1731}}}{\left(1 + \frac{[\text{s\_1372}]}{\text{Km1372}}\right) \cdot \left(1 + \frac{[\text{s\_1731}]}{\text{Km1731}}\right) + 1 + \frac{[\text{s\_1732}]}{\text{Km1732}} - 1} \tag{747}$$

Table 1496: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	☑
Vmax		0000324	0.230	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	☑
Km1372		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1731		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1732		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.374 Reaction r_1621

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name D-glucose transport via diffusion (extracellular to periplasm) irreversible

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0659} \xrightleftharpoons{\text{s\_0659, s\_0657}} \text{s\_0657} \tag{748}$$

Reactant

Table 1497: Properties of each reactant.

Id	Name	SBO
s_0659	D-Glucose	

Modifiers

Table 1498: Properties of each modifier.

Id	Name	SBO
s_0659	D-Glucose	
s_0657	D-Glucose	

Product

Table 1499: Properties of each product.

Id	Name	SBO
s_0657	D-Glucose	

Kinetic Law

Derived unit contains undeclared units

$$v_{374} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_0659]} - \text{[s\_0657]})}{\text{Km0659}}}{1 + \frac{\text{[s\_0659]}}{\text{Km0659}} + 1 + \frac{\text{[s\_0657]}}{\text{Km0657}} - 1} \tag{749}$$

Table 1500: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.000	dimensionless	☑
Vmax		0000324	3.333	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0659		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0657		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.375 Reaction r_1622

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name D-glucose transport via PEP:Pyr PTS (periplasm)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1484} + \text{s\_0657} \xrightleftharpoons{\text{s\_1484, s\_0657, s\_0663, s\_1531}} \text{s\_0663} + \text{s\_1531} \tag{750}$$

Reactants

Table 1501: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_0657	D-Glucose	

Modifiers

Table 1502: Properties of each modifier.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_0657	D-Glucose	
s_0663	D-Glucose 6-phosphate	
s_1531	Pyruvate	

Products

Table 1503: Properties of each product.

Id	Name	SBO
s_0663	D-Glucose 6-phosphate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{375} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1484}] \cdot [\mathrm{s\_0657}] - \frac{[\mathrm{s\_0663}] \cdot [\mathrm{s\_1531}]}{\mathrm{Keq}} \right)}{\mathrm{Km1484} \cdot \mathrm{Km0657}}}{\left(1 + \frac{[\mathrm{s\_1484}]}{\mathrm{Km1484}}\right) \cdot \left(1 + \frac{[\mathrm{s\_0657}]}{\mathrm{Km0657}}\right) + \left(1 + \frac{[\mathrm{s\_0663}]}{\mathrm{Km0663}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1531}]}{\mathrm{Km1531}}\right) - 1} \tag{751}$$

Table 1504: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.022	dimensionless	☑
Vmax		0000324	0.310	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1484		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0657		0000322	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0663		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑
Km1531		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.376 Reaction r_1714

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name Fructose transport via PEP:Pyr PTS (f6p generating) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_1484} + \mathrm{s\_0622} \xrightleftharpoons{\mathrm{s\_1484,\ s\_0622,\ s\_0627,\ s\_1531}} \mathrm{s\_0627} + \mathrm{s\_1531} \tag{752}$$

Reactants

Table 1505: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_0622	D-Fructose	

Modifiers

Table 1506: Properties of each modifier.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	

Id	Name	SBO
s_0622	D-Fructose	
s_0627	D-Fructose 6-phosphate	
s_1531	Pyruvate	

Products

Table 1507: Properties of each product.

Id	Name	SBO
s_0627	D-Fructose 6-phosphate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{376} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1484}] \cdot [\text{s\_0622}] - \frac{[\text{s\_0627}] \cdot [\text{s\_1531}]}{\text{Keq}} \right)}{\text{Km1484} \cdot \text{Km0622}}}{\left(1 + \frac{[\text{s\_1484}]}{\text{Km1484}}\right) \cdot \left(1 + \frac{[\text{s\_0622}]}{\text{Km0622}}\right) + \left(1 + \frac{[\text{s\_0627}]}{\text{Km0627}}\right) \cdot \left(1 + \frac{[\text{s\_1531}]}{\text{Km1531}}\right) - 1} \tag{753}$$

Table 1508: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	☑
Vmax		0000324	0.155	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1484		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0622		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0627		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.377 Reaction r_1792

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name iron (II) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0840} \xrightleftharpoons{\text{s\_0840, s\_0838}} \text{s\_0838} \tag{754}$$

Reactant

Table 1509: Properties of each reactant.

Id	Name	SBO
s_0840	Fe2+	

Modifiers

Table 1510: Properties of each modifier.

Id	Name	SBO
s_0840	Fe2+	
s_0838	Fe2+	

Product

Table 1511: Properties of each product.

Id	Name	SBO
s_0838	Fe2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{377} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s\_0840}] - [\text{s\_0838}])}{\text{Km0840}}}{1 + \frac{[\text{s\_0840}]}{\text{Km0840}} + 1 + \frac{[\text{s\_0838}]}{\text{Km0838}} - 1} \tag{755}$$

Table 1512: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	☑
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0840		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0838		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.378 Reaction r_1793

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name iron (III) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0843} \xrightleftharpoons{\text{s\_0843, s\_0841}} \text{s\_0841} \tag{756}$$

Reactant

Table 1513: Properties of each reactant.

Id	Name	SBO
s_0843	Fe3+	

Modifiers

Table 1514: Properties of each modifier.

Id	Name	SBO
s_0843	Fe3+	
s_0841	Fe3+	

Product

Table 1515: Properties of each product.

Id	Name	SBO
s_0841	Fe3+	

Kinetic Law

Derived unit contains undeclared units

$$v_{378} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s\_0843}] - [\text{s\_0841}])}{\text{Km0843}}}{1 + \frac{[\text{s\_0843}]}{\text{Km0843}} + 1 + \frac{[\text{s\_0841}]}{\text{Km0841}} - 1} \tag{757}$$

Table 1516: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	☑
Vmax		0000324	0.004	$\mathrm{mmol \cdot l^{-1} \cdot s^{-1}}$	☑
Km0843		0000322	1.000	$\mathrm{mmol \cdot l^{-1}}$	☑
Km0841		0000323	0.100	$\mathrm{mmol \cdot l^{-1}}$	☑

6.379 Reaction r_1906

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name magnesium (Mg+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\mathrm{s\_1214} \xrightleftharpoons{\mathrm{s\_1214,\ s\_1212}} \mathrm{s\_1212} \tag{758}$$

Reactant

Table 1517: Properties of each reactant.

Id	Name	SBO
s_1214	magnesium	

Modifiers

Table 1518: Properties of each modifier.

Id	Name	SBO
s_1214	magnesium	
s_1212	magnesium	

Product

Table 1519: Properties of each product.

Id	Name	SBO
s_1212	magnesium	

Kinetic Law

Derived unit contains undeclared units

$$v_{379} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_1214]} - \text{[s\_1212]})}{\text{Km1214}}}{1 + \frac{\text{[s\_1214]}}{\text{Km1214}} + 1 + \frac{\text{[s\_1212]}}{\text{Km1212}} - 1} \tag{759}$$

Table 1520: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	☑
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1214		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1212		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.380 Reaction r_1923

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name Manganese (Mn+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1257} \xrightleftharpoons{\text{s\_1257, s\_1255}} \text{s\_1255} \tag{760}$$

Reactant

Table 1521: Properties of each reactant.

Id	Name	SBO
s_1257	Mn2+	

Modifiers

Table 1522: Properties of each modifier.

Id	Name	SBO
s_1257	Mn2+	
s_1255	Mn2+	

Product

Table 1523: Properties of each product.

Id	Name	SBO
s_1255	Mn2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{380} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_1257]} - \text{[s\_1255]})}{\text{Km1257}}}{1 + \frac{\text{[s\_1257]}}{\text{Km1257}} + 1 + \frac{\text{[s\_1255]}}{\text{Km1255}} - 1} \tag{761}$$

Table 1524: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.57150633208474 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$3.19050211069491 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1257		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1255		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.381 Reaction r_1939

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Methanol transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1248} \xrightarrow{\text{s\_1248}} \text{s\_1250} \tag{762}$$

Reactant

Table 1525: Properties of each reactant.

Id	Name	SBO
s_1248	Methanol	

Modifier

Table 1526: Properties of each modifier.

Id	Name	SBO
s_1248	Methanol	

Product

Table 1527: Properties of each product.

Id	Name	SBO
s_1250	Methanol	

Kinetic Law

Derived unit contains undeclared units

$$v_{381} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot [\text{s\_1248}]}{\text{Km1248}}}{1 + \frac{[\text{s\_1248}]}{\text{Km1248}}} \tag{763}$$

Table 1528: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$5.54066935769518 \cdot 10^{-7}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1248		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.382 Reaction r_1943

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name molybdate transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1263} \overset{\text{s\_1263, s\_1261}}{\rightleftharpoons} \text{s\_1261} \tag{764}$$

Reactant

Table 1529: Properties of each reactant.

Id	Name	SBO
s_1263	Molybdate	

Modifiers

Table 1530: Properties of each modifier.

Id	Name	SBO
s_1263	Molybdate	
s_1261	Molybdate	

Product

Table 1531: Properties of each product.

Id	Name	SBO
s_1261	Molybdate	

Kinetic Law

Derived unit contains undeclared units

$$v_{382} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_1263]} - \text{[s\_1261]})}{\text{Km1263}}}{1 + \frac{\text{[s\_1263]}}{\text{Km1263}} + 1 + \frac{\text{[s\_1261]}}{\text{Km1261}} - 1} \tag{765}$$

Table 1532: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.78686587096806 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$5.95621956989353 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1263		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1261		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.383 Reaction r_1944

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name murein polymerizing transglycosylase

SBO:0000176 biochemical reaction

Reaction equation

$$2\,\mathrm{s\_1776} \xrightleftharpoons{\mathrm{s\_1776,\ s\_1765,\ s\_1725}} 2\,\mathrm{s\_1765} + \mathrm{s\_1725} \qquad (766)$$

Reactant

Table 1533: Properties of each reactant.

Id	Name
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim

Modifiers

Table 1534: Properties of each modifier.

Id	Name
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim
s_1765	Undecaprenyl diphosphate
s_1725	two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)

Products

Table 1535: Properties of each product.

Id	Name	SBO
s_1765	Undecaprenyl diphosphate	
s_1725	two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)	

Kinetic Law

Derived unit contains undeclared units

$$v_{383} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1776}]^2 - \frac{[\text{s\_1765}]^2 \cdot [\text{s\_1725}]}{\text{Keq}} \right)}{\text{Km1776}^2}}{\left(1 + \frac{[\text{s\_1776}]}{\text{Km1776}}\right)^2 + \left(1 + \frac{[\text{s\_1765}]}{\text{Km1765}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1725}]}{\text{Km1725}}\right) - 1} \tag{767}$$

Table 1536: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	☑
Vmax		0000324	0.042	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1776		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1765		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1725		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.384 Reaction r_1962

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name NAD(P) transhydrogenase (periplasm)

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1334} + \text{s\_1335} \xrightleftharpoons{\text{s\_1334, s\_1335, s\_1333, s\_1336}} \text{s\_1333} + \text{s\_1336} \tag{768}$$

Reactants

Table 1537: Properties of each reactant.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 1538: Properties of each modifier.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 1539: Properties of each product.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{384} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_1334}] \cdot [\mathrm{s\_1335}] - \frac{[\mathrm{s\_1333}] \cdot [\mathrm{s\_1336}]}{\mathrm{Keq}} \right)}{\mathrm{Km1334} \cdot \mathrm{Km1335}}}{\left(1 + \frac{[\mathrm{s\_1334}]}{\mathrm{Km1334}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1335}]}{\mathrm{Km1335}}\right) + \left(1 + \frac{[\mathrm{s\_1333}]}{\mathrm{Km1333}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1336}]}{\mathrm{Km1336}}\right) - 1} \tag{769}$$

Table 1540: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.062	dimensionless	☑
Vmax		0000324	14.870	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1334		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1335		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1333		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1336		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.385 Reaction r_1968

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name nickel transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\mathrm{s\_1331} \xrightleftharpoons{\mathrm{s\_1331},\ \mathrm{s\_1329}} \mathrm{s\_1329} \tag{770}$$

Reactant

Table 1541: Properties of each reactant.

Id	Name	SBO
s_1331	nickel	

Modifiers

Table 1542: Properties of each modifier.

Id	Name	SBO
s_1331	nickel	
s_1329	nickel	

Product

Table 1543: Properties of each product.

Id	Name	SBO
s_1329	nickel	

Kinetic Law

Derived unit contains undeclared units

$$v_{385} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot (\mathrm{[s\_1331]} - \mathrm{[s\_1329]})}{\mathrm{Km1331}}}{1 + \frac{\mathrm{[s\_1331]}}{\mathrm{Km1331}} + 1 + \frac{\mathrm{[s\_1329]}}{\mathrm{Km1329}} - 1} \tag{771}$$

Table 1544: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.47409051412934 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$1.49136350470978 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Km1331		0000322	1.000	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1329		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.386 Reaction r_2002

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name oxygen transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1374} \xrightleftharpoons{\text{s\_1374, s\_1372}} \text{s\_1372} \tag{772}$$

Reactant

Table 1545: Properties of each reactant.

Id	Name	SBO
s_1374	O2	

Modifiers

Table 1546: Properties of each modifier.

Id	Name	SBO
s_1374	O2	
s_1372	O2	

Product

Table 1547: Properties of each product.

Id	Name	SBO
s_1372	O2	

Kinetic Law

Derived unit contains undeclared units

$$v_{386} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_1374]} - \text{[s\_1372]})}{\text{Km1374}}}{1 + \frac{\text{[s\_1374]}}{\text{Km1374}} + 1 + \frac{\text{[s\_1372]}}{\text{Km1372}} - 1} \tag{773}$$

Table 1548: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	☑
Vmax		0000324	0.077	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Km1374		0000322	1.000	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1372		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.387 Reaction r_2011

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name phosphate transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\mathrm{s\_1432} \xrightleftharpoons{\mathrm{s\_1432},\ \mathrm{s\_1430}} \mathrm{s\_1430} \tag{774}$$

Reactant

Table 1549: Properties of each reactant.

Id	Name	SBO
s_1432	Phosphate	

Modifiers

Table 1550: Properties of each modifier.

Id	Name	SBO
s_1432	Phosphate	
s_1430	Phosphate	

Product

Table 1551: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{387} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_1432]} - \text{[s\_1430]})}{\text{Km1432}}}{1 + \frac{\text{[s\_1432]}}{\text{Km1432}} + 1 + \frac{\text{[s\_1430]}}{\text{Km1430}} - 1} \tag{775}$$

Table 1552: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.131	dimensionless	☑
Vmax		0000324	0.437	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1432		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.388 Reaction r_2047

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name potassium transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1496} \xrightleftharpoons{\text{s\_1496, s\_1494}} \text{s\_1494} \tag{776}$$

Reactant

Table 1553: Properties of each reactant.

Id	Name	SBO
s_1496	potassium	

Modifiers

Table 1554: Properties of each modifier.

Id	Name	SBO
s_1496	potassium	
s_1494	potassium	

Product

Table 1555: Properties of each product.

Id	Name	SBO
s_1494	potassium	

Kinetic Law

Derived unit contains undeclared units

$$v_{388} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_1496]} - \text{[s\_1494]})}{\text{Km1496}}}{1 + \frac{\text{[s\_1496]}}{\text{Km1496}} + 1 + \frac{\text{[s\_1494]}}{\text{Km1494}} - 1} \tag{777}$$

Table 1556: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.027	dimensionless	☑
Vmax		0000324	0.090	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1496		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1494		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.389 Reaction r_2108

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name sulfate transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1611} \xrightleftharpoons{\text{s\_1611, s\_1609}} \text{s\_1609} \tag{778}$$

Reactant

Table 1557: Properties of each reactant.

Id	Name	SBO
s_1611	Sulfate	

Modifiers

Table 1558: Properties of each modifier.

Id	Name	SBO
s_1611	Sulfate	
s_1609	Sulfate	

Product

Table 1559: Properties of each product.

Id	Name	SBO
s_1609	Sulfate	

Kinetic Law

Derived unit contains undeclared units

$$v_{389} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s\_1611}] - [\text{s\_1609}])}{\text{Km1611}}}{1 + \frac{[\text{s\_1611}]}{\text{Km1611}} + 1 + \frac{[\text{s\_1609}]}{\text{Km1609}} - 1} \tag{779}$$

Table 1560: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	☑
Vmax		0000324	0.116	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1611		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1609		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.390 Reaction r_2167

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name zinc (Zn+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1806} \underset{\text{s\_1806, s\_1804}}{\rightleftharpoons} \text{s\_1804} \tag{780}$$

Reactant

Table 1561: Properties of each reactant.

Id	Name	SBO
s_1806	Zinc	

Modifiers

Table 1562: Properties of each modifier.

Id	Name	SBO
s_1806	Zinc	
s_1804	Zinc	

Product

Table 1563: Properties of each product.

Id	Name	SBO
s_1804	Zinc	

Kinetic Law

Derived unit contains undeclared units

$$v_{390} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot (\text{[s\_1806]} - \text{[s\_1804]})}{\text{Km1806}}}{1 + \frac{\text{[s\_1806]}}{\text{Km1806}} + 1 + \frac{\text{[s\_1804]}}{\text{Km1804}} - 1} \tag{781}$$

Table 1564: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.72342063565976 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$1.57447354521992 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1806		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1804		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.391 Reaction r_2195

This is a reversible reaction of three reactants forming four products influenced by seven modifiers.

Name 2-Octaprenylphenol hydroxylase (anaerobic)

SBO:0000176 biochemical reaction

Reaction equation

$$\mathrm{s\_0229} + 2\,\mathrm{s\_0467} + \mathrm{s\_1333} \xrightleftharpoons{\mathrm{s\_0229,\ s\_0467,\ s\_1333,\ s\_0226,\ s\_0421,\ s\_1334,\ s\_1430}} \mathrm{s\_0226} + 2\,\mathrm{s\_0421} + \mathrm{s\_1334} + 2 \quad (782)$$

Reactants

Table 1565: Properties of each reactant.

Id	Name	SBO
s_0229	2-Octaprenylphenol	
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 1566: Properties of each modifier.

Id	Name	SBO
s_0229	2-Octaprenylphenol	
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	
s_0226	2-Octaprenyl-6-hydroxyphenol	
s_0421	ADP	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1430	Phosphate	

Products

Table 1567: Properties of each product.

Id	Name	SBO
s_0226	2-Octaprenyl-6-hydroxyphenol	

Id	Name	SBO
s_0421	ADP	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{391} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0229}] \cdot [\text{s\_0467}]^2 \cdot [\text{s\_1333}] - \frac{[\text{s\_0226}] \cdot [\text{s\_0421}]^2 \cdot [\text{s\_1334}] \cdot [\text{s\_1430}]^2}{\text{Keq}} \right)}{\text{Km0229} \cdot \text{Km0467}^2 \cdot \text{Km1333}}}{\left(1 + \frac{[\text{s\_0229}]}{\text{Km0229}}\right) \cdot \left(1 + \frac{[\text{s\_0467}]}{\text{Km0467}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) + \left(1 + \frac{[\text{s\_0226}]}{\text{Km0226}}\right) \cdot \left(1 + \frac{[\text{s\_0421}]}{\text{Km0421}}\right)^2 \cdot \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right)} \quad (783)$$

Table 1568: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317453432 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	☑
Km0229		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0226		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.392 Reaction r_2310

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name Dihydroneopterin monophosphate dephosphorylase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0766} \xrightleftharpoons{\text{s\_0766, s\_0765, s\_1430}} \text{s\_0765} + \text{s\_1430} \quad (784)$$

Reactant

Table 1569: Properties of each reactant.

Id	Name	SBO
s_0766	Dihydroneopterin monophosphate	

Modifiers

Table 1570: Properties of each modifier.

Id	Name	SBO
s_0766	Dihydroneopterin monophosphate	
s_0765	Dihydroneopterin	
s_1430	Phosphate	

Products

Table 1571: Properties of each product.

Id	Name	SBO
s_0765	Dihydroneopterin	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{392} = \frac{\frac{\mathrm{vol(cell)} \cdot \mathrm{Vmax} \cdot \left([\mathrm{s\_0766}] - \frac{[\mathrm{s\_0765}] \cdot [\mathrm{s\_1430}]}{\mathrm{Keq}} \right)}{\mathrm{Km0766}}}{1 + \frac{[\mathrm{s\_0766}]}{\mathrm{Km0766}} + \left(1 + \frac{[\mathrm{s\_0765}]}{\mathrm{Km0765}}\right) \cdot \left(1 + \frac{[\mathrm{s\_1430}]}{\mathrm{Km1430}}\right) - 1} \tag{785}$$

Table 1572: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
Keq		0000281	0.200	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0766		0000322	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km0765		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
Km1430		0000323	0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑

6.393 Reaction r_2519

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name pyridoxine 5'-phosphate oxidase (anaerboic

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_1333} + \text{s\_1530} \xrightleftharpoons{\text{s\_1333, s\_1530, s\_1334, s\_1522}} \text{s\_1334} + \text{s\_1522} \tag{786}$$

Reactants

Table 1573: Properties of each reactant.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1530	Pyridoxine 5'-phosphate	

Modifiers

Table 1574: Properties of each modifier.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1530	Pyridoxine 5'-phosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1522	Pyridoxal 5'-phosphate	

Products

Table 1575: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1522	Pyridoxal 5'-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{393} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_1333}] \cdot [\text{s\_1530}] - \frac{[\text{s\_1334}] \cdot [\text{s\_1522}]}{\text{Keq}} \right)}{\text{Km1333} \cdot \text{Km1530}}}{\left(1 + \frac{[\text{s\_1333}]}{\text{Km1333}}\right) \cdot \left(1 + \frac{[\text{s\_1530}]}{\text{Km1530}}\right) + \left(1 + \frac{[\text{s\_1334}]}{\text{Km1334}}\right) \cdot \left(1 + \frac{[\text{s\_1522}]}{\text{Km1522}}\right) - 1} \tag{787}$$

Table 1576: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892316991383 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$4.32449243787936 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	2.000	dimensionless	☑
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1530		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1522		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.394 Reaction r_2521

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name pyrimidine phosphatase

SBO:0000176 biochemical reaction

Reaction equation

$$\text{s\_0346} \xrightleftharpoons{\text{s\_0346, s\_0311, s\_1430}} \text{s\_0311} + \text{s\_1430} \tag{788}$$

Reactant

Table 1577: Properties of each reactant.

Id	Name	SBO
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	

Modifiers

Table 1578: Properties of each modifier.

Id	Name	SBO
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	

Id	Name	SBO
s_1430	Phosphate	

Products

Table 1579: Properties of each product.

Id	Name	SBO
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{394} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot \left([\text{s\_0346}] - \frac{[\text{s\_0311}] \cdot [\text{s\_1430}]}{\text{Keq}} \right)}{\text{Km0346}}}{1 + \frac{[\text{s\_0346}]}{\text{Km0346}} + \left(1 + \frac{[\text{s\_0311}]}{\text{Km0311}}\right) \cdot \left(1 + \frac{[\text{s\_1430}]}{\text{Km1430}}\right) - 1} \tag{789}$$

Table 1580: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.17784634458656 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0346		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km0311		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.395 Reaction r_2533

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran to leave system

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0003} \xrightarrow{\text{s\_0003}} \text{s\_1807} \tag{790}$$

Reactant

Table 1581: Properties of each reactant.

Id	Name	SBO
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Modifier

Table 1582: Properties of each modifier.

Id	Name	SBO
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Product

Table 1583: Properties of each product.

Id	Name	SBO
s_1807	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Kinetic Law

Derived unit contains undeclared units

$$v_{395} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot [\text{s\_0003}]}{\text{Km0003}}}{1 + \frac{[\text{s\_0003}]}{\text{Km0003}}} \tag{791}$$

Table 1584: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$1.24110993828479 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0003		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.396 Reaction r_2534

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow 5'-deoxyribose to leave system

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_0334} \xrightarrow{\text{s\_0334}} \text{s\_1835} \tag{792}$$

Reactant

Table 1585: Properties of each reactant.

Id	Name	SBO
s_0334	5'-deoxyribose	

Modifier

Table 1586: Properties of each modifier.

Id	Name	SBO
s_0334	5'-deoxyribose	

Product

Table 1587: Properties of each product.

Id	Name	SBO
s_1835	5'-deoxyribose	

Kinetic Law

Derived unit contains undeclared units

$$v_{396} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot [\text{s\_0334}]}{\text{Km0334}}}{1 + \frac{[\text{s\_0334}]}{\text{Km0334}}} \tag{793}$$

Table 1588: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.11662651885034 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.23325303770068 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km0334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.397 Reaction r_2537

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow p-Cresol to leave system

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1407} \xrightarrow{\text{s\_1407}} \text{s\_2072} \tag{794}$$

Reactant

Table 1589: Properties of each reactant.

Id	Name	SBO
s_1407	p-Cresol	

Modifier

Table 1590: Properties of each modifier.

Id	Name	SBO
s_1407	p-Cresol	

Product

Table 1591: Properties of each product.

Id	Name	SBO
s_2072	p-Cresol	

Kinetic Law

Derived unit contains undeclared units

$$v_{397} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot [\text{s\_1407}]}{\text{Km1407}}}{1 + \frac{[\text{s\_1407}]}{\text{Km1407}}} \tag{795}$$

Table 1592: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	☑
Vmax		0000324	$6.17784634458726 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1407		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.398 Reaction r_2538

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow S-Adenosyl-4-methylthio-2-oxobutanoate to leave system

SBO:0000185 transport reaction

Reaction equation

$$\text{s\_1550} \xrightarrow{\text{s\_1550}} \text{s\_2093} \tag{796}$$

Reactant

Table 1593: Properties of each reactant.

Id	Name	SBO
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	

Modifier

Table 1594: Properties of each modifier.

Id	Name	SBO
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	

Product

Table 1595: Properties of each product.

Id	Name	SBO
s_2093	S-Adenosyl-4-methylthio-2-oxobutanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{398} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot [\text{s\_1550}]}{\text{Km1550}}}{1 + \frac{[\text{s\_1550}]}{\text{Km1550}}} \tag{797}$$

Table 1596: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467995043 \cdot 10^{-7}$	dimensionless	☑
Vmax		0000324	$5.54066935990086 \cdot 10^{-7}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	☑
Km1550		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	☑

6.399 Reaction r_2584

This is an irreversible reaction of 65 reactants forming three products influenced by 65 modifiers.

Name growth

SBO:0000176 biochemical reaction

Reaction equation

$$2.23 \cdot 10^{-4}\text{s\_0133} + 2.6 \cdot 10^{-5}\text{s\_0378} + 2.23 \cdot 10^{-4}\text{s\_0226} + 2.6 \cdot 10^{-4}\text{s\_0380} + 0 \cdot 5137\,\text{s\_1041} + 2.23 \cdot 10^{-4}\text{s\_1552} + \tag{798}$$

Reactants

Table 1597: Properties of each reactant.

Id	Name
s_0133	10-Formyltetrahydrofolate
s_0378	[2Fe-2S] iron-sulfur cluster
s_0226	2-Octaprenyl-6-hydroxyphenol
s_0380	[4Fe-4S] iron-sulfur cluster
s_1041	L-Alanine
s_1552	S-Adenosyl-L-methionine
s_1061	L-Arginine
s_1068	L-Asparagine
s_1072	L-Aspartate
s_0467	ATP

Id	Name
s_0480	bis-molybdopterin guanine dinucleotide
s_0476	Biotin
s_0497	Calcium
s_0520	Chloride
s_0555	Coenzyme A
s_0546	Co2+
s_0575	CTP
s_0579	Cu2+
s_1083	L-Cysteine
s_0726	dATP
s_0731	dCTP
s_0760	dGTP
s_0805	dTTP
s_0859	Flavin adenine dinucleotide oxidized
s_0838	Fe2+
s_0841	Fe3+
s_1101	L-Glutamine
s_1095	L-Glutamate
s_0929	Glycine
s_0945	GTP
s_1106	L-Histidine
s_1119	L-Isoleucine
s_1494	potassium
s_1127	L-Leucine
s_1131	L-Lysine
s_1141	L-Methionine
s_1212	magnesium
s_0336	5,10-Methylenetetrahydrofolate
s_1255	Mn2+
s_1261	Molybdate
s_1333	Nicotinamide adenine dinucleotide
s_1335	Nicotinamide adenine dinucleotide phosphate
s_0451	Ammonium
s_1329	nickel
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)
s_1151	L-Phenylalanine
s_1508	Protoheme
s_1155	L-Proline
s_1522	Pyridoxal 5'-phosphate
s_1546	Riboflavin
s_1170	L-Serine

Id	Name
s_1577	Siroheme
s_1609	Sulfate
s_0337	5,6,7,8-Tetrahydrofolate
s_1644	Thiamine diphosphate
s_1179	L-Threonine
s_1185	L-Tryptophan
s_1189	L-Tyrosine
s_1765	Undecaprenyl diphosphate
s_1792	UTP
s_1193	L-Valine
s_1804	Zinc
s_1033	KDO(2)-lipid IV(A)
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of cl

Modifiers

Table 1598: Properties of each modifier.

Id	Name
s_0133	10-Formyltetrahydrofolate
s_0378	[2Fe-2S] iron-sulfur cluster
s_0226	2-Octaprenyl-6-hydroxyphenol
s_0380	[4Fe-4S] iron-sulfur cluster
s_1041	L-Alanine
s_1552	S-Adenosyl-L-methionine
s_1061	L-Arginine
s_1068	L-Asparagine
s_1072	L-Aspartate
s_0467	ATP
s_0480	bis-molybdopterin guanine dinucleotide
s_0476	Biotin
s_0497	Calcium
s_0520	Chloride
s_0555	Coenzyme A
s_0546	Co2+
s_0575	CTP
s_0579	Cu2+
s_1083	L-Cysteine
s_0726	dATP
s_0731	dCTP
s_0760	dGTP

Id	Name
s_0805	dTTP
s_0859	Flavin adenine dinucleotide oxidized
s_0838	Fe2+
s_0841	Fe3+
s_1101	L-Glutamine
s_1095	L-Glutamate
s_0929	Glycine
s_0945	GTP
s_1106	L-Histidine
s_1119	L-Isoleucine
s_1494	potassium
s_1127	L-Leucine
s_1131	L-Lysine
s_1141	L-Methionine
s_1212	magnesium
s_0336	5,10-Methylenetetrahydrofolate
s_1255	Mn2+
s_1261	Molybdate
s_1333	Nicotinamide adenine dinucleotide
s_1335	Nicotinamide adenine dinucleotide phosphate
s_0451	Ammonium
s_1329	nickel
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)
s_1151	L-Phenylalanine
s_1508	Protoheme
s_1155	L-Proline
s_1522	Pyridoxal 5'-phosphate
s_1546	Riboflavin
s_1170	L-Serine
s_1577	Siroheme
s_1609	Sulfate
s_0337	5,6,7,8-Tetrahydrofolate
s_1644	Thiamine diphosphate
s_1179	L-Threonine
s_1185	L-Tryptophan
s_1189	L-Tyrosine
s_1765	Undecaprenyl diphosphate
s_1792	UTP
s_1193	L-Valine
s_1804	Zinc
s_1033	KDO(2)-lipid IV(A)

Id	Name
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of cl

Products

Table 1599: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{399} = \mathrm{vol}\,(\mathrm{cell}) \tag{799}$$
$$\cdot \max\left(\mathrm{V0}\cdot\left(1+\mathrm{ep0133}\cdot\left(\frac{[\mathrm{s\_0133}]}{\mathrm{ic0133}}\right)+\mathrm{ep0378}\cdot\left(\frac{[\mathrm{s\_0378}]}{\mathrm{ic0378}}\right)+\mathrm{ep0226}\cdot\left(\frac{[\mathrm{s\_0226}]}{\mathrm{ic0226}}\right)\right.\right.$$
$$+\,\mathrm{ep0380}\cdot\left(\frac{[\mathrm{s\_0380}]}{\mathrm{ic0380}}\right)+\mathrm{ep1041}\cdot\left(\frac{[\mathrm{s\_1041}]}{\mathrm{ic1041}}\right)+\mathrm{ep1552}\cdot\left(\frac{[\mathrm{s\_1552}]}{\mathrm{ic1552}}\right)+\mathrm{ep1061}$$
$$\cdot\left(\frac{[\mathrm{s\_1061}]}{\mathrm{ic1061}}\right)+\mathrm{ep1068}\cdot\left(\frac{[\mathrm{s\_1068}]}{\mathrm{ic1068}}\right)+\mathrm{ep1072}\cdot\left(\frac{[\mathrm{s\_1072}]}{\mathrm{ic1072}}\right)+\mathrm{ep0467}\cdot\left(\frac{[\mathrm{s\_0467}]}{\mathrm{ic0467}}\right)$$
$$+\,\mathrm{ep0480}\cdot\left(\frac{[\mathrm{s\_0480}]}{\mathrm{ic0480}}\right)+\mathrm{ep0476}\cdot\left(\frac{[\mathrm{s\_0476}]}{\mathrm{ic0476}}\right)+\mathrm{ep0497}\cdot\left(\frac{[\mathrm{s\_0497}]}{\mathrm{ic0497}}\right)+\mathrm{ep0520}$$
$$\cdot\left(\frac{[\mathrm{s\_0520}]}{\mathrm{ic0520}}\right)+\mathrm{ep0555}\cdot\left(\frac{[\mathrm{s\_0555}]}{\mathrm{ic0555}}\right)+\mathrm{ep0546}\cdot\left(\frac{[\mathrm{s\_0546}]}{\mathrm{ic0546}}\right)+\mathrm{ep0575}\cdot\left(\frac{[\mathrm{s\_0575}]}{\mathrm{ic0575}}\right)$$
$$+\,\mathrm{ep0579}\cdot\left(\frac{[\mathrm{s\_0579}]}{\mathrm{ic0579}}\right)+\mathrm{ep1083}\cdot\left(\frac{[\mathrm{s\_1083}]}{\mathrm{ic1083}}\right)+\mathrm{ep0726}\cdot\left(\frac{[\mathrm{s\_0726}]}{\mathrm{ic0726}}\right)+\mathrm{ep0731}$$
$$\cdot\left(\frac{[\mathrm{s\_0731}]}{\mathrm{ic0731}}\right)+\mathrm{ep0760}\cdot\left(\frac{[\mathrm{s\_0760}]}{\mathrm{ic0760}}\right)+\mathrm{ep0805}\cdot\left(\frac{[\mathrm{s\_0805}]}{\mathrm{ic0805}}\right)+\mathrm{ep0859}\cdot\left(\frac{[\mathrm{s\_0859}]}{\mathrm{ic0859}}\right)$$
$$+\,\mathrm{ep0838}\cdot\left(\frac{[\mathrm{s\_0838}]}{\mathrm{ic0838}}\right)+\mathrm{ep0841}\cdot\left(\frac{[\mathrm{s\_0841}]}{\mathrm{ic0841}}\right)+\mathrm{ep1101}\cdot\left(\frac{[\mathrm{s\_1101}]}{\mathrm{ic1101}}\right)+\mathrm{ep1095}$$
$$\cdot\left(\frac{[\mathrm{s\_1095}]}{\mathrm{ic1095}}\right)+\mathrm{ep0929}\cdot\left(\frac{[\mathrm{s\_0929}]}{\mathrm{ic0929}}\right)+\mathrm{ep0945}\cdot\left(\frac{[\mathrm{s\_0945}]}{\mathrm{ic0945}}\right)+\mathrm{ep1106}\cdot\left(\frac{[\mathrm{s\_1106}]}{\mathrm{ic1106}}\right)$$
$$+\,\mathrm{ep1119}\cdot\left(\frac{[\mathrm{s\_1119}]}{\mathrm{ic1119}}\right)+\mathrm{ep1494}\cdot\left(\frac{[\mathrm{s\_1494}]}{\mathrm{ic1494}}\right)+\mathrm{ep1127}\cdot\left(\frac{[\mathrm{s\_1127}]}{\mathrm{ic1127}}\right)+\mathrm{ep1131}$$
$$\cdot\left(\frac{[\mathrm{s\_1131}]}{\mathrm{ic1131}}\right)+\mathrm{ep1141}\cdot\left(\frac{[\mathrm{s\_1141}]}{\mathrm{ic1141}}\right)+\mathrm{ep1212}\cdot\left(\frac{[\mathrm{s\_1212}]}{\mathrm{ic1212}}\right)+\mathrm{ep0336}\cdot\left(\frac{[\mathrm{s\_0336}]}{\mathrm{ic0336}}\right)$$
$$+\mathrm{ep1255}\cdot\left(\frac{[\mathrm{s\_1255}]}{\mathrm{ic1255}}\right)+\mathrm{ep1261}\cdot\left(\frac{[\mathrm{s\_1261}]}{\mathrm{ic1261}}\right)+\mathrm{ep1333}\cdot\left(\frac{[\mathrm{s\_1333}]}{\mathrm{ic1333}}\right)+\mathrm{ep1335}\cdot\left(\frac{[\mathrm{s\_1335}]}{\mathrm{ic1335}}\right)$$
$$+\mathrm{ep0451}\cdot\left(\frac{[\mathrm{s\_0451}]}{\mathrm{ic0451}}\right)+\mathrm{ep1329}\cdot\left(\frac{[\mathrm{s\_1329}]}{\mathrm{ic1329}}\right)+\mathrm{ep1437}\cdot\left(\frac{[\mathrm{s\_1437}]}{\mathrm{ic1437}}\right)+\mathrm{ep1435}\cdot\left(\frac{[\mathrm{s\_1435}]}{\mathrm{ic1435}}\right)$$
$$+\mathrm{ep1151}\cdot\left(\frac{[\mathrm{s\_1151}]}{\mathrm{ic1151}}\right)+\mathrm{ep1508}\cdot\left(\frac{[\mathrm{s\_1508}]}{\mathrm{ic1508}}\right)+\mathrm{ep1155}\cdot\left(\frac{[\mathrm{s\_1155}]}{\mathrm{ic1155}}\right)+\mathrm{ep1522}\cdot\left(\frac{[\mathrm{s\_1522}]}{\mathrm{ic1522}}\right)$$
$$+\mathrm{ep1546}\cdot\left(\frac{[\mathrm{s\_1546}]}{\mathrm{ic1546}}\right)+\mathrm{ep1170}\cdot\left(\frac{[\mathrm{s\_1170}]}{\mathrm{ic1170}}\right)+\mathrm{ep1577}\cdot\left(\frac{[\mathrm{s\_1577}]}{\mathrm{ic1577}}\right)+\mathrm{ep1609}\cdot\left(\frac{[\mathrm{s\_1609}]}{\mathrm{ic1609}}\right)$$
$$+\mathrm{ep0337}\cdot\left(\frac{[\mathrm{s\_0337}]}{\mathrm{ic0337}}\right)+\mathrm{ep1644}\cdot\left(\frac{[\mathrm{s\_1644}]}{\mathrm{ic1644}}\right)+\mathrm{ep1179}\cdot\left(\frac{[\mathrm{s\_1179}]}{\mathrm{ic1179}}\right)+\mathrm{ep1185}\cdot\left(\frac{[\mathrm{s\_1185}]}{\mathrm{ic1185}}\right)$$
$$+\mathrm{ep1189}\cdot\left(\frac{[\mathrm{s\_1189}]}{\mathrm{ic1189}}\right)+\mathrm{ep1765}\cdot\left(\frac{[\mathrm{s\_1765}]}{\mathrm{ic1765}}\right)+\mathrm{ep1792}\cdot\left(\frac{[\mathrm{s\_1792}]}{\mathrm{ic1792}}\right)+\mathrm{ep1193}\cdot\left(\frac{[\mathrm{s\_1193}]}{\mathrm{ic1193}}\right)$$
$$\left.\left.+\,\mathrm{ep1804}\cdot\left(\frac{[\mathrm{s\_1804}]}{\mathrm{ic1804}}\right)+\mathrm{ep1033}\cdot\left(\frac{[\mathrm{s\_1033}]}{\mathrm{ic1033}}\right)+\mathrm{ep1719}\cdot\left(\frac{[\mathrm{s\_1719}]}{\mathrm{ic1719}}\right)\right),\mathrm{zero\_flux}\right)$$

$$\max(\mathrm{x},\mathrm{y}) = \frac{\mathrm{x}+\mathrm{y}+|\mathrm{x}-\mathrm{y}|}{2} \tag{800}$$

$$\max(x, y) = \frac{x + y + |x - y|}{2} \tag{801}$$

Table 1600: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.139	dimensionless	☑
zero_flux			0.000	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
V0			0.139	$\mathrm{mmol} \cdot \mathrm{l}^{-1} \cdot \mathrm{s}^{-1}$	☑
ic0133			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0133			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic0378			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0378			$2.6 \cdot 10^{-5}$	dimensionless	☑
ic0226			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0226			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic0380			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0380			$2.6 \cdot 10^{-4}$	dimensionless	☑
ic1041			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1041			0.514	dimensionless	☑
ic1552			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1552			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic1061			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1061			0.296	dimensionless	☑
ic1068			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1068			0.241	dimensionless	☑
ic1072			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1072			0.241	dimensionless	☑
ic0467			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0467			54.120	dimensionless	☑
ic0480			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0480			$1.22 \cdot 10^{-4}$	dimensionless	☑
ic0476			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0476			$2 \cdot 10^{-6}$	dimensionless	☑
ic0497			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0497			0.005	dimensionless	☑
ic0520			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0520			0.005	dimensionless	☑
ic0555			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0555			$5.76 \cdot 10^{-4}$	dimensionless	☑
ic0546			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0546			$2.5 \cdot 10^{-5}$	dimensionless	☑
ic0575			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0575			0.134	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
ic0579			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0579			$7.09 \cdot 10^{-4}$	dimensionless	☑
ic1083			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1083			0.092	dimensionless	☑
ic0726			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0726			0.026	dimensionless	☑
ic0731			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0731			0.027	dimensionless	☑
ic0760			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0760			0.027	dimensionless	☑
ic0805			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0805			0.026	dimensionless	☑
ic0859			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0859			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic0838			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0838			0.007	dimensionless	☑
ic0841			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0841			0.008	dimensionless	☑
ic1101			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1101			0.263	dimensionless	☑
ic1095			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1095			0.263	dimensionless	☑
ic0929			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0929			0.613	dimensionless	☑
ic0945			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0945			0.215	dimensionless	☑
ic1106			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1106			0.095	dimensionless	☑
ic1119			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1119			0.291	dimensionless	☑
ic1494			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1494			0.195	dimensionless	☑
ic1127			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1127			0.451	dimensionless	☑
ic1131			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1131			0.343	dimensionless	☑
ic1141			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1141			0.154	dimensionless	☑
ic1212			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1212			0.009	dimensionless	☑
ic0336			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0336			$2.23 \cdot 10^{-4}$	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
ic1255			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1255			$6.91 \cdot 10^{-4}$	dimensionless	☑
ic1261			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1261			$7 \cdot 10^{-6}$	dimensionless	☑
ic1333			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1333			0.002	dimensionless	☑
ic1335			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1335			$4.47 \cdot 10^{-4}$	dimensionless	☑
ic0451			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0451			0.013	dimensionless	☑
ic1329			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1329			$3.23 \cdot 10^{-4}$	dimensionless	☑
ic1437			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1437			0.064	dimensionless	☑
ic1435			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1435			0.075	dimensionless	☑
ic1151			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1151			0.185	dimensionless	☑
ic1508			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1508			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic1155			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1155			0.221	dimensionless	☑
ic1522			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1522			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic1546			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1546			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic1170			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1170			0.216	dimensionless	☑
ic1577			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1577			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic1609			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1609			0.004	dimensionless	☑
ic0337			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep0337			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic1644			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1644			$2.23 \cdot 10^{-4}$	dimensionless	☑
ic1179			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1179			0.254	dimensionless	☑
ic1185			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1185			0.057	dimensionless	☑
ic1189			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1189			0.138	dimensionless	☑

Id	Name	SBO	Value	Unit	Constant
ic1765			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1765			$5.5 \cdot 10^{-5}$	dimensionless	☑
ic1792			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1792			0.144	dimensionless	☑
ic1193			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1193			0.423	dimensionless	☑
ic1804			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1804			$3.41 \cdot 10^{-4}$	dimensionless	☑
ic1033			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1033			0.019	dimensionless	☑
ic1719			0.100	$\mathrm{mmol} \cdot \mathrm{l}^{-1}$	☑
ep1719			0.014	dimensionless	☑

7 Derived Rate Equations

When interpreted as an ordinary differential equation framework, this model implies the following set of equations for the rates of change of each species.

7.1 Species s_0003

Name (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran

SBO:0000247 simple chemical

Notes iJO1366:M_mththf_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2533 and as a product in r_0001 and as a modifier in r_0001, r_2533).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0003} = v_1 - v_{395} \tag{802}$$

7.2 Species s_0004

Name (2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one

SBO:0000247 simple chemical

Notes iJO1366:M_mdhdhf_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0001 and as a product in r_0176 and as a modifier in r_0001, r_0176).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0004} = v_{55} - v_{1} \tag{803}$$

7.3 Species s_0017

Name (R)-2,3-Dihydroxy-3-methylbutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_23dhmb_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0517 and as a product in r_0811 and as a modifier in r_0517, r_0811).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0017} = v_{219} - v_{146} \tag{804}$$

7.4 Species s_0018

Name (R)-2,3-Dihydroxy-3-methylpentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_23dhmp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0518 and as a product in r_0812 and as a modifier in r_0518, r_0812).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0018} = v_{220} - v_{147} \tag{805}$$

7.5 Species s_0028

Name (R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_3hmrsACP_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1378, r_1391 and as a product in r_0154 and as a modifier in r_0154, r_1378, r_1391).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0028} = v_{52} - v_{345} - v_{349} \tag{806}$$

7.6 Species s_0029

Name (R)-Glycerate

SBO:0000247 simple chemical

Notes iJO1366:M_glyc_DASH_R_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0697 and as a product in r_1335 and as a modifier in r_0697, r_1335).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0029} = v_{327} - v_{180} \tag{807}$$

7.7 Species s_0032

Name (R)-Pantoate

SBO:0000247 simple chemical

Notes iJO1366:M_pant_DASH_R_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1076 and as a product in r_0063 and as a modifier in r_0063, r_1076).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0032} = v_{13} - v_{262} \tag{808}$$

7.8 Species s_0033

Name (R)-Pantothenate

SBO:0000247 simple chemical

Notes iJO1366:M_pnto_DASH_R_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1075 and as a product in r_1076 and as a modifier in r_1075, r_1076).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0033} = v_{262} - v_{261} \tag{809}$$

7.9 Species s_0040

Name (S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate

SBO:0000247 simple chemical

Notes iJO1366:M_25aics_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0302 and as a product in r_1210 and as a modifier in r_0302, r_1210).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0040} = v_{286} - v_{96} \tag{810}$$

7.10 Species s_0041

Name (S)-2-Aceto-2-hydroxybutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2ahbut_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0812 and as a product in r_0038 and as a modifier in r_0038, r_0812).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0041} = v_{9} - v_{220} \tag{811}$$

7.11 Species s_0042

Name (S)-2-Acetolactate

SBO:0000247 simple chemical

Notes iJO1366:M_alac_DASH_S_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0811 and as a product in r_0227 and as a modifier in r_0227, r_0811).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0042} = v_{69} - v_{219} \tag{812}$$

7.12 Species s_0043

Name (S)-3-Hydroxybutanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hbcoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0120 and as a product in r_0135 and as a modifier in r_0120, r_0135).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0043} = v_{42} - v_{29} \tag{813}$$

7.13 Species s_0044

Name (S)-3-Hydroxydecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hdcoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0121 and as a product in r_0128 and as a modifier in r_0121, r_0128).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0044} = v_{36} - v_{30} \tag{814}$$

7.14 Species s_0045

Name (S)-3-Hydroxydodecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hddcoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0122 and as a product in r_0129 and as a modifier in r_0122, r_0129).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0045} = v_{37} - v_{31} \tag{815}$$

7.15 Species s_0046

Name (S)-3-Hydroxyhexadecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hhdcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0123 and as a product in r_0130 and as a modifier in r_0123, r_0130).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0046} = v_{38} - v_{32} \tag{816}$$

7.16 Species s_0047

Name (S)-3-Hydroxyhexanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hhcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0124 and as a product in r_0131 and as a modifier in r_0124, r_0131).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0047} = v_{39} - v_{33} \tag{817}$$

7.17 Species s_0049

Name (S)-3-Hydroxyoctanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hocoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0126 and as a product in r_0133 and as a modifier in r_0126, r_0133).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0049} = v_{40} - v_{34} \tag{818}$$

7.18 Species s_0050

Name (S)-3-Hydroxytetradecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3htdcoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0127 and as a product in r_0134 and as a modifier in r_0127, r_0134).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0050} = v_{41} - v_{35} \tag{819}$$

7.19 Species s_0051

Name (S)-3-Methyl-2-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3mop_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0808 and as a product in r_0518 and as a modifier in r_0518, r_0808).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0051} = v_{147} - v_{218} \tag{820}$$

7.20 Species s_0052

Name (S)-Dihydroorotate

SBO:0000247 simple chemical

Notes iJO1366:M_dhor_DASH_S_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0501, r_0512 and as a product in r_0511 and as a modifier in r_0501, r_0511, r_0512).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0052} = v_{143} - v_{136} - v_{144} \tag{821}$$

7.21 Species s_0073

Name 1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pa161_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0419 and as a product in r_0012 and as a modifier in r_0012, r_0419).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0073} = v_5 - v_{119} \tag{822}$$

7.22 Species s_0075

Name 1,2-dihexadecanoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pa160_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0418 and as a product in r_0013 and as a modifier in r_0013, r_0418).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0075} = v_6 - v_{118} \tag{823}$$

7.23 Species s_0096

Name 1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2cpr5p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0788 and as a product in r_1211 and as a modifier in r_0788, r_1211).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0096} = v_{287} - v_{209} \tag{824}$$

7.24 Species s_0097

Name 1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_prfp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0008 and as a product in r_1204 and as a modifier in r_0008, r_1204).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0097} = v_{280} - v_2 \tag{825}$$

7.25 Species s_0098

Name 1-(5-Phosphoribosyl)-AMP

SBO:0000247 simple chemical

Notes iJO1366:M_prbamp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1204 and as a product in r_1205 and as a modifier in r_1204, r_1205).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0098} = v_{281} - v_{280} \tag{826}$$

7.26 Species s_0099

Name 1-(5-Phosphoribosyl)-ATP

SBO:0000247 simple chemical

Notes iJO1366:M_prbatp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1205 and as a product in r_0374 and as a modifier in r_0374, r_1205).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0099} = v_{112} - v_{281} \tag{827}$$

7.27 Species s_0116

Name 1-deoxy-D-xylulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dxyl5p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0011, r_1245, r_1346 and as a product in r_0009 and as a modifier in r_0009, r_0011, r_1245, r_1346).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0116} = v_3 - v_4 - v_{300} - v_{332} \tag{828}$$

7.28 Species s_0119

Name 1-hexadec-9-enoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_1hdec9eg3p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0012 and as a product in r_0707 and as a modifier in r_0012, r_0707).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0119} = v_{182} - v_5 \tag{829}$$

7.29 Species s_0121

Name 1-hexadecanoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_1hdecg3p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0013 and as a product in r_0706 and as a modifier in r_0013, r_0706).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0121} = v_{181} - v_6 \tag{830}$$

7.30 Species s_0123

Name 1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_h2mb4p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0014, r_0015 and as a product in r_0084 and as a modifier in r_0014, r_0015, r_0084).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0123} = v_{17} - v_7 - v_8 \tag{831}$$

7.31 Species s_0128

Name 1-Pyrroline-5-carboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_1pyr5c_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1250 and as a product in r_0835 and as a modifier in r_0835, r_1250).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0128} = v_{223} - v_{301} \tag{832}$$

7.32 Species s_0133

Name 10-Formyltetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_10fthf_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_1209, r_2584 and as a product in r_0622, r_0950 and as a modifier in r_0622, r_0950, r_1209, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0133} = v_{162} + v_{232} - v_{285} - 2.23\cdot 10^{-4} v_{399} \tag{833}$$

7.33 Species s_0147

Name 2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_lipidA_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0102 and as a product in r_1337 and as a modifier in r_0102, r_1337).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0147} = v_{328} - v_{25} \tag{834}$$

7.34 Species s_0148

Name 2,3,4,5-Tetrahydrodipicolinate

SBO:0000247 simple chemical

Notes iJO1366:M_thdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1338 and as a product in r_0502 and as a modifier in r_0502, r_1338).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0148} = v_{137} - v_{329} \tag{835}$$

7.35 Species s_0149

Name 2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_lipidX_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0857 and as a product in r_1402 and as a modifier in r_0857, r_1402).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0149} = v_{356} - v_{227} \tag{836}$$

7.36 Species s_0155

Name 2,3-Dihydrodipicolinate

SBO:0000247 simple chemical

Notes iJO1366:M_23dhdp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0502 and as a product in r_0503 and as a modifier in r_0502, r_0503).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0155} = v_{138} - v_{137} \tag{837}$$

7.37 Species s_0160

Name 2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_25drapp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0498 and as a product in r_0745 and as a modifier in r_0498, r_0745).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0160} = v_{192} - v_{133} \tag{838}$$

7.38 Species s_0162

Name 2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine

SBO:0000247 simple chemical

Notes iJO1366:M_fpram_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1208 and as a product in r_1212 and as a modifier in r_1208, r_1212).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0162} = v_{288} - v_{284} \tag{839}$$

7.39 Species s_0191

Name 2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ahdt_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0510 and as a product in r_0744 and as a modifier in r_0510, r_0744).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0191} = v_{191} - v_{142} \tag{840}$$

7.40 Species s_0193

Name 2-C-methyl-D-erythritol 2,4-cyclodiphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2mecdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0084 and as a product in r_0053 and as a modifier in r_0053, r_0084).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0193} = v_{10} - v_{17} \tag{841}$$

7.41 Species s_0194

Name 2-C-methyl-D-erythritol 4-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2me4p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0054 and as a product in r_0011 and as a modifier in r_0011, r_0054).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0194} = v_{4} - v_{11} \tag{842}$$

7.42 Species s_0195

Name 2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2dda7p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0099 and as a product in r_0101 and as a modifier in r_0099, r_0101).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0195} = v_{24} - v_{22} \tag{843}$$

7.43 Species s_0201

Name 2-Dehydro-3-deoxy-D-gluconate 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2ddg6p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0056 and as a product in r_0217 and as a modifier in r_0056, r_0217).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0201} = v_{64} - v_{12} \tag{844}$$

7.44 Species s_0203

Name 2-Dehydropantoate

SBO:0000247 simple chemical

Notes iJO1366:M_2dhp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0063 and as a product in r_0143 and as a modifier in r_0063, r_0143).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0203} = v_{45} - v_{13} \tag{845}$$

7.45 Species s_0214

Name 2-Hydroxy-3-oxopropanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2h3oppan_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1335 and as a product in r_0739 and as a modifier in r_0739, r_1335).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0214} = v_{189} - v_{327} \tag{846}$$

7.46 Species s_0217

Name 2-Isopropylmaleate

SBO:0000247 simple chemical

Notes iJO1366:M_2ippm_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0138 and as a product in r_0066 and as a modifier in r_0066, r_0138).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0217} = v_{14} - v_{43} \tag{847}$$

7.47 Species s_0218

Name 2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2mahmp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1344 and as a product in r_1198 and as a modifier in r_1198, r_1344).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0218} = v_{276} - v_{330} \tag{848}$$

7.48 Species s_0226

Name 2-Octaprenyl-6-hydroxyphenol

SBO:0000247 simple chemical

Notes iJO1366:M_2ohph_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_2195 and as a modifier in r_2195, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0226} = v_{391} - 2.23 \cdot 10^{-4} v_{399} \tag{849}$$

7.49 Species s_0229

Name 2-Octaprenylphenol

SBO:0000247 simple chemical

Notes iJO1366:M_2oph_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2195 and as a product in r_1064 and as a modifier in r_1064, r_2195).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0229} = v_{256} - v_{391} \tag{850}$$

7.50 Species s_0231

Name 2-Oxo-3-hydroxy-4-phosphobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_ohpb_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1054 and as a product in r_0573 and as a modifier in r_0573, r_1054).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0231} = v_{154} - v_{253} \tag{851}$$

7.51 Species s_0232

Name 2-Oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2obut_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0038 and as a product in r_0847 and as a modifier in r_0038, r_0847).

$$\frac{\text{d}}{\text{d}t}\text{s\_0232} = v_{224} - v_9 \tag{852}$$

7.52 Species s_0233

Name 2-Oxoglutarate

SBO:0000247 simple chemical

Notes iJO1366:M_akg_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 28 reactions (as a reactant in r_0675 and as a product in r_0245, r_0370, r_0765, r_0806, r_0808, r_0815, r_0854, r_1054, r_1081, r_1217, r_1318, r_1376, r_1425 and as a modifier in r_0245, r_0370, r_0675, r_0765, r_0806, r_0808, r_0815, r_0854, r_1054, r_1081, r_1217, r_1318, r_1376, r_1425).

$$\begin{aligned}\frac{\text{d}}{\text{d}t}\text{s\_0233} = {} & v_{80} + v_{110} + v_{199} + v_{217} + v_{218} + v_{221} + v_{226} \\ & + v_{253} + v_{263} + v_{291} + v_{324} + v_{344} + v_{363} - v_{170}\end{aligned} \tag{853}$$

7.53 Species s_0237

Name 2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol

SBO:0000247 simple chemical

Notes iJO1366:M_2p4c2me_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0053 and as a product in r_0178 and as a modifier in r_0053, r_0178).

$$\frac{\text{d}}{\text{d}t}\text{s\_0237} = v_{56} - v_{10} \tag{854}$$

7.54 Species s_0252

Name 3'-Phosphoadenylyl sulfate

SBO:0000247 simple chemical

Notes iJO1366:M_paps_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1139 and as a product in r_0305 and as a modifier in r_0305, r_1139).

$$\frac{\text{d}}{\text{d}t}\text{s\_0252} = v_{99} - v_{270} \tag{855}$$

7.55 Species s_0255

Name 3,4-dihydroxy-2-butanone 4-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_db4p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1265 and as a product in r_0092 and as a modifier in r_0092, r_1265).

$$\frac{\text{d}}{\text{d}t}\text{s\_0255} = v_{19} - v_{307} \tag{856}$$

7.56 Species s_0262

Name 3-(4-Hydroxyphenyl)pyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_34hpp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1376 and as a product in r_1225 and as a modifier in r_1225, r_1376).

$$\frac{\text{d}}{\text{d}t}\text{s\_0262} = v_{297} - v_{344} \tag{857}$$

7.57 Species s_0263

Name 3-(Imidazol-4-yl)-2-oxopropyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_imacp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0765 and as a product in r_0785 and as a modifier in r_0765, r_0785).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0263} = v_{206} - v_{199} \tag{858}$$

7.58 Species s_0265

Name 3-Carboxy-2-hydroxy-4-methylpentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3c2hmp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0139 and as a product in r_0138 and as a modifier in r_0138, r_0139).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0265} = v_{43} - v_{44} \tag{859}$$

7.59 Species s_0266

Name 3-Carboxy-3-hydroxy-4-methylpentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3c3hmp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0066 and as a product in r_0067 and as a modifier in r_0066, r_0067).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0266} = v_{15} - v_{14} \tag{860}$$

7.60 Species s_0267

Name 3-Carboxy-4-methyl-2-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3c4mop_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0078 and as a product in r_0139 and as a modifier in r_0078, r_0139).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0267} = v_{44} - v_{16} \tag{861}$$

7.61 Species s_0269

Name 3-Dehydroquinate

SBO:0000247 simple chemical

Notes iJO1366:M_3dhq_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0098 and as a product in r_0099 and as a modifier in r_0098, r_0099).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0269} = v_{22} - v_{21} \tag{862}$$

7.62 Species s_0270

Name 3-Dehydroshikimate

SBO:0000247 simple chemical

Notes iJO1366:M_3dhsk_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1304 and as a product in r_0098 and as a modifier in r_0098, r_1304).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0270} = v_{21} - v_{318} \tag{863}$$

7.63 Species s_0271

Name 3-Deoxy-D-manno-2-octulosonate

SBO:0000247 simple chemical

Notes iJO1366:M_kdo_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0105 and as a product in r_0106 and as a modifier in r_0105, r_0106).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0271} = v_{28} - v_{27} \tag{864}$$

7.64 Species s_0272

Name 3-Deoxy-D-manno-octulosonate 8-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_kdo8p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0106 and as a product in r_0100 and as a modifier in r_0100, r_0106).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0272} = v_{23} - v_{28} \tag{865}$$

7.65 Species s_0276

Name 3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_hgmeACP_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0145 and as a product in r_0146 and as a modifier in r_0145, r_0146).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0276} = v_{47} - v_{46} \tag{866}$$

7.66 Species s_0277

Name 3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_hpmeACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0148 and as a product in r_0149 and as a modifier in r_0148, r_0149).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0277} = v_{50} - v_{49} \tag{867}$$

7.67 Species s_0282

Name 3-Methyl-2-oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3mob_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0067, r_0143, r_1425 and as a product in r_0517 and as a modifier in r_0067, r_0143, r_0517, r_1425).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0282} = v_{146} - v_{15} - v_{45} - v_{363} \tag{868}$$

7.68 Species s_0283

Name 3-Octaprenyl-4-hydroxybenzoate

SBO:0000247 simple chemical

Notes iJO1366:M_3ophb_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1064 and as a product in r_0775 and as a modifier in r_0775, r_1064).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0283} = v_{203} - v_{256} \tag{869}$$

7.69 Species s_0289

Name 3-Oxo-glutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_ogmeACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0146 and as a product in r_0147 and as a modifier in r_0146, r_0147).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0289} = v_{48} - v_{47} \tag{870}$$

7.70 Species s_0290

Name 3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_opmeACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0149 and as a product in r_0150 and as a modifier in r_0149, r_0150).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0290} = v_{51} - v_{50} \tag{871}$$

7.71 Species s_0293

Name 3-Oxodecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3odcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0128 and as a product in r_0235 and as a modifier in r_0128, r_0235).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0293} = v_{75} - v_{36} \tag{872}$$

7.72 Species s_0295

Name 3-Oxododecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3oddcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0129 and as a product in r_0232 and as a modifier in r_0129, r_0232).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0295} = v_{72} - v_{37} \tag{873}$$

7.73 Species s_0297

Name 3-Oxohexadecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3ohdcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0130 and as a product in r_0236 and as a modifier in r_0130, r_0236).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0297} = v_{76} - v_{38} \tag{874}$$

7.74 Species s_0299

Name 3-Oxohexanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3ohcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0131 and as a product in r_0231 and as a modifier in r_0131, r_0231).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0299} = v_{71} - v_{39} \tag{875}$$

7.75 Species s_0303

Name 3-Oxooctanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3oocoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0133 and as a product in r_0234 and as a modifier in r_0133, r_0234).

$$\frac{\text{d}}{\text{d}t}\text{s\_0303} = v_{74} - v_{40} \tag{876}$$

7.76 Species s_0304

Name 3-Oxotetradecanoyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_3omrsACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0154 and as a product in r_0166 and as a modifier in r_0154, r_0166).

$$\frac{\text{d}}{\text{d}t}\text{s\_0304} = v_{53} - v_{52} \tag{877}$$

7.77 Species s_0305

Name 3-Oxotetradecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3otdcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0134 and as a product in r_0233 and as a modifier in r_0134, r_0233).

$$\frac{\text{d}}{\text{d}t}\text{s\_0305} = v_{73} - v_{41} \tag{878}$$

7.78 Species s_0306

Name 3-Phospho-D-glycerate

SBO:0000247 simple chemical

Notes iJO1366:M_3pg_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1151, r_1153 and as a product in r_1152 and as a modifier in r_1151, r_1152, r_1153).

$$\frac{\text{d}}{\text{d}t}\text{s\_0306} = v_{274} - v_{273} - v_{275} \tag{879}$$

7.79 Species s_0307

Name 3-Phospho-D-glyceroyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_13dpg_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1152 and as a product in r_0695 and as a modifier in r_0695, r_1152).

$$\frac{\text{d}}{\text{d}t}\text{s\_0307} = v_{179} - v_{274} \tag{880}$$

7.80 Species s_0308

Name 3-Phosphohydroxypyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_3php_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1217 and as a product in r_1151 and as a modifier in r_1151, r_1217).

$$\frac{\text{d}}{\text{d}t}\text{s\_0308} = v_{273} - v_{291} \tag{881}$$

7.81 Species s_0310

Name 4,5-dihydroxy-2,3-pentanedione

SBO:0000247 simple chemical

Notes iJO1366:M_dhptd_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0176 and as a product in r_1291 and as a modifier in r_0176, r_1291).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0310} = v_{316} - v_{55} \tag{882}$$

7.82 Species s_0311

Name 4-(1-D-Ribitylamino)-5-aminouracil

SBO:0000247 simple chemical

Notes iJO1366:M_4r5au_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1265 and as a product in r_1266, r_2521 and as a modifier in r_1265, r_1266, r_2521).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0311} = v_{308} + v_{394} - v_{307} \tag{883}$$

7.83 Species s_0312

Name 4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol

SBO:0000247 simple chemical

Notes iJO1366:M_4c2me_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0178 and as a product in r_0054 and as a modifier in r_0054, r_0178).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0312} = v_{11} - v_{56} \tag{884}$$

7.84 Species s_0313

Name 4-Amino-2-methyl-5-phosphomethylpyrimidine

SBO:0000247 simple chemical

Notes iJO1366:M_4ampm_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1198 and as a product in r_0179 and as a modifier in r_0179, r_1198).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0313} = v_{57} - v_{276} \tag{885}$$

7.85 Species s_0316

Name 4-amino-4-deoxychorismate

SBO:0000247 simple chemical

Notes iJO1366:M_4adcho_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0182 and as a product in r_0181 and as a modifier in r_0181, r_0182).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0316} = v_{58} - v_{59} \tag{886}$$

7.86 Species s_0318

Name 4-Aminobenzoate

SBO:0000247 simple chemical

Notes iJO1366:M_4abz_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0515 and as a product in r_0182 and as a modifier in r_0182, r_0515).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0318} = v_{59} - v_{145} \tag{887}$$

7.87 Species s_0325

Name 4-Hydroxybenzoate

SBO:0000247 simple chemical

Notes iJO1366:M_4hbz_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0775 and as a product in r_0424 and as a modifier in r_0424, r_0775).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0325} = v_{121} - v_{203} \tag{888}$$

7.88 Species s_0328

Name 4-Methyl-2-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_4mop_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0854 and as a product in r_0078 and as a modifier in r_0078, r_0854).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0328} = v_{16} - v_{226} \tag{889}$$

7.89 Species s_0330

Name 4-Methyl-5-(2-phosphoethyl)-thiazole

SBO:0000247 simple chemical

Notes iJO1366:M_4mpetz_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1344 and as a product in r_1346 and as a modifier in r_1344, r_1346).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0330} = v_{332} - v_{330} \tag{890}$$

7.90 Species s_0331

Name 4-Phospho-D-erythronate

SBO:0000247 simple chemical

Notes iJO1366:M_4per_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0573 and as a product in r_0574 and as a modifier in r_0573, r_0574).

$$\frac{\text{d}}{\text{d}t}\text{s\_0331} = v_{155} - v_{154} \tag{891}$$

7.91 Species s_0332

Name 4-Phospho-L-aspartate

SBO:0000247 simple chemical

Notes iJO1366:M_4pasp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0371 and as a product in r_0369 and as a modifier in r_0369, r_0371).

$$\frac{\text{d}}{\text{d}t}\text{s\_0332} = v_{109} - v_{111} \tag{892}$$

7.92 Species s_0333

Name 5'-Deoxyadenosine

SBO:0000247 simple chemical

Notes iJO1366:M_dad_DASH_5_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0186 and as a product in r_0383, r_1375 and as a modifier in r_0186, r_0383, r_1375).

$$\frac{\text{d}}{\text{d}t}\text{s\_0333} = v_{113} + v_{343} - v_{60} \tag{893}$$

7.93 Species s_0334

Name 5'-deoxyribose

SBO:0000247 simple chemical

Notes iJO1366:M_5drib_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2534 and as a product in r_0186 and as a modifier in r_0186, r_2534).

$$\frac{\text{d}}{\text{d}t}\text{s\_0334} = v_{60} - v_{396} \tag{894}$$

7.94 Species s_0335

Name 5,10-Methenyltetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_methf_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0950 and as a product in r_0957 and as a modifier in r_0950, r_0957).

$$\frac{\text{d}}{\text{d}t}\text{s\_0335} = v_{235} - v_{232} \tag{895}$$

7.95 Species s_0336

Name 5,10-Methylenetetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_mlthf_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0143, r_0211, r_0957, r_1353, r_2584 and as a product in r_0726 and as a modifier in r_0143, r_0211, r_0726, r_0957, r_1353, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_0336} = v_{185} - v_{45} - v_{61} - v_{235} - v_{336} - 2.23 \cdot 10^{-4} v_{399} \tag{896}$$

7.96 Species s_0337

Name 5,6,7,8-Tetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_thf_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in r_0622, r_0726, r_2584 and as a product in r_0143, r_0504, r_0954, r_1209 and as a modifier in r_0143, r_0504, r_0622, r_0726, r_0954, r_1209, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0337} = v_{45} + v_{139} + v_{234} + v_{285} - v_{162} - v_{185} - 2.23 \cdot 10^{-4} v_{399} \tag{897}$$

7.97 Species s_0341

Name 5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_prlp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0784 and as a product in r_0008 and as a modifier in r_0008, r_0784).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0341} = v_2 - v_{205} \tag{898}$$

7.98 Species s_0342

Name 5-amino-1-(5-phospho-D-ribosyl)imidazole

SBO:0000247 simple chemical

Notes iJO1366:M_air_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0179, r_1206 and as a product in r_1208 and as a modifier in r_0179, r_1206, r_1208).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0342} = v_{284} - v_{57} - v_{282} \tag{899}$$

7.99 Species s_0343

Name 5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_aicar_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1209 and as a product in r_0302, r_0784 and as a modifier in r_0302, r_0784, r_1209).

$$\frac{\text{d}}{\text{d}t}\text{s\_0343} = v_{96} + v_{205} - v_{285} \tag{900}$$

7.100 Species s_0344

Name 5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_5aizc_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1210 and as a product in r_1207 and as a modifier in r_1207, r_1210).

$$\frac{\text{d}}{\text{d}t}\text{s\_0344} = v_{283} - v_{286} \tag{901}$$

7.101 Species s_0345

Name 5-Amino-4-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_5aop_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1223 and as a product in r_0678 and as a modifier in r_0678, r_1223).

$$\frac{\text{d}}{\text{d}t}\text{s\_0345} = v_{172} - 2v_{295} \tag{902}$$

7.102 Species s_0346

Name 5-Amino-6-(5'-phosphoribitylamino)uracil

SBO:0000247 simple chemical

Notes iJO1366:M_5aprbu_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2521 and as a product in r_0212 and as a modifier in r_0212, r_2521).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0346} = v_{62} - v_{394} \tag{903}$$

7.103 Species s_0347

Name 5-Amino-6-(5'-phosphoribosylamino)uracil

SBO:0000247 simple chemical

Notes iJO1366:M_5apru_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0212 and as a product in r_0498 and as a modifier in r_0212, r_0498).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0347} = v_{133} - v_{62} \tag{904}$$

7.104 Species s_0352

Name 5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_fprica_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0786 and as a product in r_1209 and as a modifier in r_0786, r_1209).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0352} = v_{285} - v_{207} \tag{905}$$

7.105 Species s_0354

Name 5-Methyltetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_5mthf_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0954 and as a product in r_0211 and as a modifier in r_0211, r_0954).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0354} = v_{61} - v_{234} \tag{906}$$

7.106 Species s_0359

Name 5-O-(1-Carboxyvinyl)-3-phosphoshikimate

SBO:0000247 simple chemical

Notes iJO1366:M_3psme_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0425 and as a product in r_0175 and as a modifier in r_0175, r_0425).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0359} = v_{54} - v_{122} \tag{907}$$

7.107 Species s_0360

Name 5-Phospho-alpha-D-ribose 1-diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_prpp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0348, r_0374, r_0682, r_1021, r_1067 and as a product in r_1215 and as a modifier in r_0348, r_0374, r_0682, r_1021, r_1067, r_1215).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0360} = v_{290} - v_{101} - v_{112} - v_{174} - v_{247} - v_{258} \tag{908}$$

7.108 Species s_0361

Name 5-Phospho-beta-D-ribosylamine

SBO:0000247 simple chemical

Notes iJO1366:M_pram_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1214 and as a product in r_0682 and as a modifier in r_0682, r_1214).

$$\frac{\text{d}}{\text{d}t}\text{s\_0361} = v_{174} - v_{289} \tag{909}$$

7.109 Species s_0362

Name 5-phosphoribosyl-5-carboxyaminoimidazole

SBO:0000247 simple chemical

Notes iJO1366:M_5caiz_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1207 and as a product in r_1206 and as a modifier in r_1206, r_1207).

$$\frac{\text{d}}{\text{d}t}\text{s\_0362} = v_{282} - v_{283} \tag{910}$$

7.110 Species s_0364

Name 6,7-Dimethyl-8-(1-D-ribityl)lumazine

SBO:0000247 simple chemical

Notes iJO1366:M_dmlz_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1266 and as a product in r_1265 and as a modifier in r_1265, r_1266).

$$\frac{\text{d}}{\text{d}t}\text{s\_0364} = v_{307} - 2v_{308} \tag{911}$$

7.111 Species s_0367

Name 6-hydroxymethyl dihydropterin

SBO:0000247 simple chemical

Notes iJO1366:M_6hmhpt_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0216 and as a product in r_0507 and as a modifier in r_0216, r_0507).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0367} = v_{141} - v_{63} \tag{912}$$

7.112 Species s_0368

Name 6-hydroxymethyl-dihydropterin pyrophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_6hmhptpp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0515 and as a product in r_0216 and as a modifier in r_0216, r_0515).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0368} = v_{63} - v_{145} \tag{913}$$

7.113 Species s_0369

Name 6-Phospho-D-gluconate

SBO:0000247 simple chemical

Notes iJO1366:M_6pgc_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0217 and as a product in r_0218 and as a modifier in r_0217, r_0218).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0369} = v_{65} - v_{64} \tag{914}$$

7.114 Species s_0370

Name 6-phospho-D-glucono-1,5-lactone

SBO:0000247 simple chemical

Notes iJO1366:M_6pgl_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0218 and as a product in r_0660 and as a modifier in r_0218, r_0660).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0370} = v_{167} - v_{65} \tag{915}$$

7.115 Species s_0371

Name 7,8-Diaminononanoate

SBO:0000247 simple chemical

Notes iJO1366:M_dann_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0489 and as a product in r_0297 and as a modifier in r_0297, r_0489).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0371} = v_{94} - v_{132} \tag{916}$$

7.116 Species s_0372

Name 7,8-Dihydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_dhf_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0504 and as a product in r_0505, r_1353 and as a modifier in r_0504, r_0505, r_1353).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0372} = v_{140} + v_{336} - v_{139} \tag{917}$$

7.117 Species s_0376

Name 8-Amino-7-oxononanoate

SBO:0000247 simple chemical

Notes iJO1366:M_8aonn_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0297 and as a product in r_0222 and as a modifier in r_0222, r_0297).

$$\frac{\text{d}}{\text{d}t}\text{s\_0376} = v_{66} - v_{94} \tag{918}$$

7.118 Species s_0377

Name [2Fe-1S] desulfurated iron-sulfur cluster

SBO:0000247 simple chemical

Notes iJO1366:M_2fe1s_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0796 and as a product in r_0383 and as a modifier in r_0383, r_0796).

$$\frac{\text{d}}{\text{d}t}\text{s\_0377} = v_{113} - v_{210} \tag{919}$$

7.119 Species s_0378

Name [2Fe-2S] iron-sulfur cluster

SBO:0000247 simple chemical

Notes iJO1366:M_2fe2s_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0383, r_2584 and as a product in r_0799 and as a modifier in r_0383, r_0799, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_0378} = v_{213} - v_{113} - 2.6 \cdot 10^{-5} v_{399} \tag{920}$$

7.120 Species s_0380

Name [4Fe-4S] iron-sulfur cluster

SBO:0000247 simple chemical

Notes iJO1366:M_4fe4s_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0801 and as a modifier in r_0801, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0380} = v_{215} - 2.6 \cdot 10^{-4} v_{399} \tag{921}$$

7.121 Species s_0381

Name Acetaldehyde

SBO:0000247 simple chemical

Notes iJO1366:M_acald_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0224 and as a product in r_1348 and as a modifier in r_0224, r_1348).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0381} = v_{334} - v_{67} \tag{922}$$

7.122 Species s_0384

Name Acetate

SBO:0000247 simple chemical

Notes iJO1366:M_ac_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0225 and as a product in r_0244, r_0452, r_1379 and as a modifier in r_0225, r_0244, r_0452, r_1379).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0384} = v_{79} + v_{128} + v_{346} - v_{68} \tag{923}$$

7.123 Species s_0391

Name Acetoacetyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_aacoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0135 and as a product in r_0230 and as a modifier in r_0135, r_0230).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0391} = v_{70} - v_{42} \tag{924}$$

7.124 Species s_0393

Name Acetyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_actp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1218 and as a product in r_0225 and as a modifier in r_0225, r_1218).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0393} = v_{68} - v_{292} \tag{925}$$

7.125 Species s_0395

Name Acetyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_accoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 38 reactions (as a reactant in r_0067, r_0230, r_0231, r_0232, r_0233, r_0234, r_0235, r_0236, r_0237, r_0428, r_0658, r_0999, r_1301 and as a product in r_0224, r_0724, r_1218, r_1251, r_1252, r_1255 and as a modifier in r_0067, r_0224, r_0230, r_0231, r_0232, r_0233, r_0234, r_0235, r_0236, r_0237, r_0428, r_0658, r_0724, r_0999, r_1218, r_1251, r_1252, r_1255, r_1301).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0395} = {} & v_{67} + v_{184} + v_{292} + v_{302} + v_{303} + v_{304} - v_{15} - 2v_{70} - v_{71} - v_{72} \\ & - v_{73} - v_{74} - v_{75} - v_{76} - v_{77} - v_{123} - v_{166} - v_{243} - v_{317}\end{aligned} \tag{926}$$

7.126 Species s_0397

Name acyl carrier protein

SBO:0000247 simple chemical

Notes iJO1366:M_ACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 26 reactions (as a reactant in r_0257, r_0259, r_0260, r_0935 and as a product in r_0012, r_0013, r_0150, r_0166, r_0222, r_0706, r_0707, r_1378, r_1391 and as a modifier in r_0012, r_0013, r_0150, r_0166, r_0222, r_0257, r_0259, r_0260, r_0706, r_0707, r_0935, r_1378, r_1391).

$$\frac{\text{d}}{\text{d}t}\text{s\_0397} = v_5 + v_6 + v_{51} + v_{53} + v_{66} + v_{181} + v_{182} + v_{345} + v_{349} - v_{83} - v_{84} - v_{85} - v_{231} \quad (927)$$

7.127 Species s_0405

Name Adenine

SBO:0000247 simple chemical

Notes iJO1366:M_ade_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1232 and as a product in r_0186, r_1288 and as a modifier in r_0186, r_1232, r_1288).

$$\frac{\text{d}}{\text{d}t}\text{s\_0405} = v_{60} + v_{315} - v_{299} \quad (928)$$

7.128 Species s_0408

Name Adenosine

SBO:0000247 simple chemical

Notes iJO1366:M_adn_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0292 and as a product in r_1232 and as a modifier in r_0292, r_1232).

$$\frac{\text{d}}{\text{d}t}\text{s\_0408} = v_{299} - v_{93} \quad (929)$$

7.129 Species s_0411

Name Adenosine 3',5'-bisphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pap_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0085 and as a product in r_1139 and as a modifier in r_0085, r_1139).

$$\frac{\text{d}}{\text{d}t}\text{s\_0411} = v_{270} - v_{18} \tag{930}$$

7.130 Species s_0412

Name Adenosine 5'-phosphosulfate

SBO:0000247 simple chemical

Notes iJO1366:M_aps_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0305 and as a product in r_1329 and as a modifier in r_0305, r_1329).

$$\frac{\text{d}}{\text{d}t}\text{s\_0412} = v_{325} - v_{99} \tag{931}$$

7.131 Species s_0420

Name adenylated molybdopterin

SBO:0000247 simple chemical

Notes iJO1366:M_mptamp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0384, r_0964 and as a product in r_0965 and as a modifier in r_0384, r_0964, r_0965).

$$\frac{\text{d}}{\text{d}t}\text{s\_0420} = v_{238} - v_{114} - v_{237} \tag{932}$$

7.132 Species s_0421

Name ADP

SBO:0000247 simple chemical

Notes iJO1366:M_adp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 105 reactions (as a reactant in r_1152, r_1222, r_1521 and as a product in r_0178, r_0225, r_0237, r_0243, r_0292, r_0301, r_0305, r_0369, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0622, r_0648, r_0673, r_0683, r_0697, r_0754, r_0761, r_0762, r_0770, r_1006, r_1039, r_1043, r_1045, r_1046, r_1047, r_1075, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1264, r_1305, r_1315, r_1337, r_1345, r_1397, r_1399, r_1400, r_1401, r_1409, r_2195, r_2584 and as a modifier in r_0178, r_0225, r_0237, r_0243, r_0292, r_0301, r_0305, r_0369, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0622, r_0648, r_0673, r_0683, r_0697, r_0754, r_0761, r_0762, r_0770, r_1006, r_1039, r_1043, r_1045, r_1046, r_1047, r_1075, r_1152, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1222, r_1264, r_1305, r_1315, r_1337, r_1345, r_1397, r_1399, r_1400, r_1401, r_1409, r_1521, r_2195).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0421} = {} & v_{56} + v_{68} + v_{77} + v_{78} + v_{93} + 2v_{95} + v_{99} + v_{109} + v_{117} + v_{125} + v_{129} + v_{130} \\ & + v_{131} + v_{132} + v_{140} + v_{149} + v_{162} + v_{164} + v_{169} + v_{175} + v_{180} + v_{193} \\ & + v_{195} + v_{196} + v_{201} + v_{244} + v_{248} + v_{249} + v_{250} + v_{251} + v_{252} + v_{261} \\ & + v_{276} + v_{282} + v_{284} + v_{286} + v_{288} + v_{289} + v_{306} + v_{319} + v_{322} + v_{328} + v_{331} \\ & + v_{352} + v_{353} + v_{354} + v_{355} + v_{357} + 2v_{391} + 53.95v_{399} - v_{274} - v_{294} - v_{366}\end{aligned} \tag{933}$$

7.133 Species s_0435

Name all-trans-Octaprenyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_octdp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0775 and as a product in r_1063 and as a modifier in r_0775, r_1063).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0435} = v_{255} - v_{203} \tag{934}$$

7.134 Species s_0445

Name alpha-D-Ribose 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_r1p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1232 and as a product in r_1202 and as a modifier in r_1202, r_1232).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0445} = v_{279} - v_{299} \tag{935}$$

7.135 Species s_0446

Name alpha-D-Ribose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_r5p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_1202, r_1215 and as a product in r_1284, r_1357 and as a modifier in r_1202, r_1215, r_1284, r_1357).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0446} = v_{313} + v_{338} - v_{279} - v_{290} \tag{936}$$

7.136 Species s_0451

Name Ammonium

SBO:0000247 simple chemical

Notes iJO1366:M_nh4_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 24 reactions (as a reactant in r_0365, r_0388, r_0675, r_0683, r_1008, r_1368, r_2584 and as a product in r_0450, r_0498, r_0777, r_0847, r_1511 and as a modifier in r_0365, r_0388, r_0450, r_0498, r_0675, r_0683, r_0777, r_0847, r_1008, r_1368, r_1511, r_2584).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0451} = {} & v_{127} + v_{133} + 4v_{204} + v_{224} + v_{365} - v_{106} - v_{117} \\ & - v_{170} - v_{175} - v_{245} - v_{342} - 0.01301v_{399}\end{aligned} \tag{937}$$

7.137 Species s_0453

Name Ammonium

SBO:0000247 simple chemical

Notes iJO1366:M_nh4_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1511 and as a modifier in r_1511), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0453} = 0 \tag{938}$$

7.138 Species s_0454

Name AMP

SBO:0000247 simple chemical

Notes iJO1366:M_amp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 38 reactions (as a reactant in r_0301 and as a product in r_0085, r_0216, r_0257, r_0259, r_0260, r_0292, r_0304, r_0361, r_0365, r_0384, r_0687, r_0741, r_0963, r_0964, r_1008, r_1076, r_1215, r_1346 and as a modifier in r_0085, r_0216, r_0257, r_0259, r_0260, r_0292, r_0301, r_0304, r_0361, r_0365, r_0384, r_0687, r_0741, r_0963, r_0964, r_1008, r_1076, r_1215, r_1346).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0454} = {} & v_{18} + v_{63} + v_{83} + v_{84} + v_{85} + v_{93} + v_{98} + v_{105} + v_{106} + v_{114} \\ & + v_{178} + v_{190} + v_{236} + v_{237} + v_{245} + v_{262} + v_{290} + v_{332} - v_{95}\end{aligned} \tag{939}$$

7.139 Species s_0457

Name Anthranilate

SBO:0000247 simple chemical

Notes iJO1366:M_anth_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0348 and as a product in r_0349 and as a modifier in r_0348, r_0349).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0457} = v_{102} - v_{101} \tag{940}$$

7.140 Species s_0467

Name ATP

SBO:0000247 simple chemical

Notes iJO1366:M_atp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 148 reactions (as a reactant in r_0178, r_0216, r_0225, r_0237, r_0243, r_0257, r_0259, r_0260, r_0292, r_0301, r_0305, r_0361, r_0365, r_0369, r_0374, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0611, r_0622, r_0648, r_0673, r_0683, r_0687, r_0697, r_0741, r_0754, r_0761, r_0762, r_0770, r_0951, r_0965, r_0969, r_1006, r_1008, r_1019, r_1039, r_1043, r_1045, r_1046, r_1047, r_1074, r_1075, r_1076, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1215, r_1264, r_1276, r_1305, r_1315, r_1329, r_1337, r_1345, r_1346, r_1397, r_1399, r_1400, r_1401, r_1409, r_2195, r_2584 and as a product in r_1152, r_1222, r_1521 and as a modifier in r_0178, r_0216, r_0225, r_0237, r_0243, r_0257, r_0259, r_0260, r_0292, r_0301, r_0305, r_0361, r_0365, r_0369, r_0374, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0611, r_0622, r_0648, r_0673, r_0683, r_0687, r_0697, r_0741, r_0754, r_0761, r_0762, r_0770, r_0951, r_0965, r_0969, r_1006, r_1008, r_1019, r_1039, r_1043, r_1045, r_1046, r_1047, r_1074, r_1075, r_1076, r_1152, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1215, r_1222, r_1264, r_1276, r_1305, r_1315, r_1329, r_1337, r_1345, r_1346, r_1397, r_1399, r_1400, r_1401, r_1409, r_1521, r_2195, r_2584).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0467} = {} & v_{274} + v_{294} + v_{366} - v_{56} - v_{63} - v_{68} - v_{77} - v_{78} - v_{83} - v_{84} - v_{85} - v_{93} - v_{95} - v_{99} \\ & - v_{105} - v_{106} - v_{109} - v_{112} - v_{117} - v_{125} - v_{129} - v_{130} - v_{131} - v_{132} - v_{140} - v_{149} \\ & - v_{161} - v_{162} - v_{164} - v_{169} - v_{175} - v_{178} - v_{180} - v_{190} - v_{193} - v_{195} - v_{196} - v_{201} \\ & - v_{233} - v_{238} - v_{240} - v_{244} - v_{245} - v_{246} - v_{248} - v_{249} - v_{250} - v_{251} - v_{252} - v_{260} \\ & - v_{261} - v_{262} - v_{276} - v_{282} - v_{284} - v_{286} - v_{288} - v_{289} - v_{290} - v_{306} - v_{309} - v_{319} - v_{322} \\ & - v_{325} - v_{328} - v_{331} - v_{332} - v_{352} - v_{353} - v_{354} - v_{355} - v_{357} - 2v_{391} - 54.12v_{399}\end{aligned} \tag{941}$$

7.141 Species s_0470

Name beta-Alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ala_DASH_B_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1076 and as a product in r_0367 and as a modifier in r_0367, r_1076).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0470} = v_{107} - v_{262} \tag{942}$$

7.142 Species s_0474

Name Bicarbonate

SBO:0000247 simple chemical

Notes iJO1366:M_hco3_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0237, r_1206 and as a product in r_0755 and as a modifier in r_0237, r_0755, r_1206).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0474} = v_{194} - v_{77} - v_{282} \tag{943}$$

7.143 Species s_0476

Name Biotin

SBO:0000247 simple chemical

Notes iJO1366:M_btn_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0383 and as a modifier in r_0383, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0476} = v_{113} - 2 \cdot 10^{-6} v_{399} \tag{944}$$

7.144 Species s_0479

Name bis-molybdenum cofactor

SBO:0000247 simple chemical

Notes iJO1366:M_bmoco_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0386 and as a product in r_0384 and as a modifier in r_0384, r_0386).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0479} = v_{114} - v_{116} \tag{945}$$

7.145 Species s_0480

Name bis-molybdopterin guanine dinucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_bmocogdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0385 and as a modifier in r_0385, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0480} = v_{115} - 1.22 \cdot 10^{-4} v_{399} \tag{946}$$

7.146 Species s_0481

Name bis-molybdopterin mono-guanine dinucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_bmoco1gdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0385 and as a product in r_0386 and as a modifier in r_0385, r_0386).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0481} = v_{116} - v_{115} \tag{947}$$

7.147 Species s_0488

Name Butanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_btcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0231 and as a product in r_0266 and as a modifier in r_0231, r_0266).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0488} = v_{86} - v_{71} \tag{948}$$

7.148 Species s_0493

Name C'-(3-Indolyl)-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_3ig3p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1367 and as a product in r_0788 and as a modifier in r_0788, r_1367).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0493} = v_{209} - v_{341} \tag{949}$$

7.149 Species s_0497

Name Calcium

SBO:0000247 simple chemical

Notes iJO1366:M_ca2_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1536 and as a modifier in r_1536, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0497} = v_{367} - 0.005205 v_{399} \tag{950}$$

7.150 Species s_0499

Name Calcium

SBO:0000247 simple chemical

Notes iJO1366:M_ca2_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1536 and as a modifier in r_1536), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0499} = 0 \tag{951}$$

7.151 Species s_0502

Name Carbamoyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_cbp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0368, r_1065 and as a product in r_0388 and as a modifier in r_0368, r_0388, r_1065).

$$\frac{\text{d}}{\text{d}t}\text{s\_0502} = v_{117} - v_{108} - v_{257} \tag{952}$$

7.152 Species s_0510

Name CDP

SBO:0000247 simple chemical

Notes iJO1366:M_cdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1039 and as a product in r_0457 and as a modifier in r_0457, r_1039).

$$\frac{\text{d}}{\text{d}t}\text{s\_0510} = v_{129} - v_{248} \tag{953}$$

7.153 Species s_0512

Name CDP-1,2-dihexadec-9-enoylglycerol

SBO:0000247 simple chemical

Notes iJO1366:M_cdpdhdec9eg_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1131 and as a product in r_0419 and as a modifier in r_0419, r_1131).

$$\frac{\text{d}}{\text{d}t}\text{s\_0512} = v_{119} - v_{267} \tag{954}$$

7.154 Species s_0513

Name CDP-1,2-dihexadecanoylglycerol

SBO:0000247 simple chemical

Notes iJO1366:M_cdpdhdecg_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1130 and as a product in r_0418 and as a modifier in r_0418, r_1130).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0513} = v_{118} - v_{266} \tag{955}$$

7.155 Species s_0520

Name Chloride

SBO:0000247 simple chemical

Notes iJO1366:M_cl_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1543 and as a modifier in r_1543, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0520} = v_{368} - 0.005205 v_{399} \tag{956}$$

7.156 Species s_0522

Name Chloride

SBO:0000247 simple chemical

Notes iJO1366:M_cl_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1543 and as a modifier in r_1543), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0522} = 0 \tag{957}$$

7.157 Species s_0526

Name chorismate

SBO:0000247 simple chemical

Notes iJO1366:M_chor_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0181, r_0349, r_0423, r_0424 and as a product in r_0425 and as a modifier in r_0181, r_0349, r_0423, r_0424, r_0425).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0526} = v_{122} - v_{58} - v_{102} - v_{120} - v_{121} \tag{958}$$

7.158 Species s_0530

Name cis-Aconitate

SBO:0000247 simple chemical

Notes iJO1366:M_acon_DASH_C_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0247 and as a product in r_0246 and as a modifier in r_0246, r_0247).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0530} = v_{81} - v_{82} \tag{959}$$

7.159 Species s_0533

Name cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_hdeACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0012, r_0707 and as a product in r_0260 and as a modifier in r_0012, r_0260, r_0707).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0533} = v_{85} - v_5 - v_{182} \tag{960}$$

7.160 Species s_0536

Name Citrate

SBO:0000247 simple chemical

Notes iJO1366:M_cit_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0246 and as a product in r_0428 and as a modifier in r_0246, r_0428).

$$\frac{\text{d}}{\text{d}t}\text{s\_0536} = v_{123} - v_{81} \tag{961}$$

7.161 Species s_0539

Name CMP

SBO:0000247 simple chemical

Notes iJO1366:M_cmp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in r_0457 and as a product in r_0053, r_0102, r_0103, r_1130, r_1131, r_1200 and as a modifier in r_0053, r_0102, r_0103, r_0457, r_1130, r_1131, r_1200).

$$\frac{\text{d}}{\text{d}t}\text{s\_0539} = v_{10} + v_{25} + v_{26} + v_{266} + v_{267} + v_{277} - v_{129} \tag{962}$$

7.162 Species s_0542

Name CMP-3-deoxy-D-manno-octulosonate

SBO:0000247 simple chemical

Notes iJO1366:M_ckdo_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0102, r_0103 and as a product in r_0105 and as a modifier in r_0102, r_0103, r_0105).

$$\frac{\text{d}}{\text{d}t}\text{s\_0542} = v_{27} - v_{25} - v_{26} \tag{963}$$

7.163 Species s_0543

Name CO2

SBO:0000247 simple chemical

Notes iJO1366:M_co2_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 64 reactions (as a reactant in r_0388, r_0489, r_0755, r_1141, r_1551 and as a product in r_0009, r_0038, r_0078, r_0147, r_0150, r_0166, r_0222, r_0227, r_0367, r_0436, r_0499, r_0739, r_0788, r_0806, r_1021, r_1064, r_1068, r_1123, r_1124, r_1201, r_1224, r_1225, r_1245, r_1251, r_1255, r_1346, r_1421 and as a modifier in r_0009, r_0038, r_0078, r_0147, r_0150, r_0166, r_0222, r_0227, r_0367, r_0388, r_0436, r_0489, r_0499, r_0739, r_0755, r_0788, r_0806, r_1021, r_1064, r_1068, r_1123, r_1124, r_1141, r_1201, r_1224, r_1225, r_1245, r_1251, r_1255, r_1346, r_1421, r_1551).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0543} = {} & v_3 + v_9 + v_{16} + v_{48} + v_{51} + v_{53} + v_{66} + v_{69} + v_{107} + 2v_{124} + v_{134} + v_{189} \\ & + v_{209} + v_{217} + v_{247} + v_{256} + v_{259} + v_{264} + v_{265} + v_{278} + v_{296} + v_{297} \\ & + v_{300} + v_{302} + v_{304} + v_{332} + 4v_{360} - v_{117} - v_{132} - v_{194} - v_{271} - v_{369}\end{aligned} \tag{964}$$

7.164 Species s_0545

Name CO2

SBO:0000247 simple chemical

Notes iJO1366:M_co2_e

Initial concentration $0\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in r_1551), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0545} = 0 \tag{965}$$

7.165 Species s_0546

Name Co2+

SBO:0000247 simple chemical

Notes iJO1366:M_cobalt2_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1557 and as a modifier in r_1557, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0546} = v_{370} - 2.5 \cdot 10^{-5} v_{399} \tag{966}$$

7.166 Species s_0548

Name Co2+

SBO:0000247 simple chemical

Notes iJO1366:M_cobalt2_e

Initial concentration $1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1557 and as a modifier in r_1557), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0548} = 0 \tag{967}$$

7.167 Species s_0555

Name Coenzyme A

SBO:0000247 simple chemical

Notes iJO1366:M_coa_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in 56 reactions (as a reactant in r_0224, r_0724, r_1218, r_1251, r_1252, r_1255, r_1315, r_2584 and as a product in r_0067, r_0147, r_0230, r_0231, r_0232, r_0233, r_0234, r_0235, r_0236, r_0428, r_0488, r_0579, r_0580, r_0581, r_0658, r_0771, r_0935, r_0999, r_1301, r_1338 and as a modifier in r_0067, r_0147, r_0224, r_0230, r_0231, r_0232, r_0233, r_0234, r_0235, r_0236, r_0428, r_0488, r_0579, r_0580, r_0581, r_0658, r_0724, r_0771, r_0935, r_0999, r_1218, r_1251, r_1252, r_1255, r_1301, r_1315, r_1338, r_2584).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0555} = {} & v_{15} + v_{48} + v_{70} + v_{71} + v_{72} + v_{73} + v_{74} + v_{75} + v_{76} + v_{123} + v_{131} \\ & + v_{157} + v_{158} + v_{159} + v_{166} + v_{202} + v_{231} + v_{243} + v_{317} + v_{329} \\ & - v_{67} - v_{184} - v_{292} - v_{302} - v_{303} - v_{304} - v_{322} - 5.76 \cdot 10^{-4} v_{399}\end{aligned} \tag{968}$$

7.168 Species s_0565

Name Coproporphyrinogen III

SBO:0000247 simple chemical

Notes iJO1366:M_cpppg3_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0436 and as a product in r_1421 and as a modifier in r_0436, r_1421).

$$\frac{\text{d}}{\text{d}t}\text{s\_0565} = v_{360} - v_{124} \tag{969}$$

7.169 Species s_0574

Name Crotonoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_b2coa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0266 and as a product in r_0120 and as a modifier in r_0120, r_0266).

$$\frac{\text{d}}{\text{d}t}\text{s\_0574} = v_{29} - v_{86} \tag{970}$$

7.170 Species s_0575

Name CTP

SBO:0000247 simple chemical

Notes iJO1366:M_ctp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 18 reactions (as a reactant in r_0054, r_0105, r_0418, r_0419, r_1200, r_1277, r_2584 and as a product in r_0440, r_1039 and as a modifier in r_0054, r_0105, r_0418, r_0419, r_0440, r_1039, r_1200, r_1277, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_0575} = v_{125} + v_{248} - v_{11} - v_{27} - v_{118} - v_{119} - v_{277} - v_{310} - 0.1335v_{399} \tag{971}$$

7.171 Species s_0579

Name Cu2+

SBO:0000247 simple chemical

Notes iJO1366:M_cu2_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0968, r_2584 and as a product in r_0384, r_0964, r_1565 and as a modifier in r_0384, r_0964, r_0968, r_1565, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0579} = v_{114} + v_{237} + v_{371} - v_{239} - 7.09 \cdot 10^{-4} v_{399} \tag{972}$$

7.172 Species s_0581

Name Cu2+

SBO:0000247 simple chemical

Notes iJO1366:M_cu2_e

Initial concentration $1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1565 and as a modifier in r_1565), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0581} = 0 \tag{973}$$

7.173 Species s_0585

Name cyclic pyranopterin monophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_cpmp_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0968 and as a product in r_0445 and as a modifier in r_0445, r_0968).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0585} = v_{126} - v_{239} \tag{974}$$

7.174 Species s_0599

Name D-4'-Phosphopantothenate

SBO:0000247 simple chemical

Notes iJO1366:M_4ppan_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1200 and as a product in r_1075 and as a modifier in r_1075, r_1200).

$$\frac{\text{d}}{\text{d}t}\text{s\_0599} = v_{261} - v_{277} \tag{975}$$

7.175 Species s_0600

Name D-Alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ala_DASH_D_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0463 and as a product in r_0310, r_0970 and as a modifier in r_0310, r_0463, r_0970).

$$\frac{\text{d}}{\text{d}t}\text{s\_0600} = v_{100} + v_{241} - 2v_{130} \tag{976}$$

7.176 Species s_0603

Name D-Alanyl-D-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_alaala_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1401 and as a product in r_0463 and as a modifier in r_0463, r_1401).

$$\frac{\text{d}}{\text{d}t}\text{s\_0603} = v_{130} - v_{355} \tag{977}$$

7.177 Species s_0611

Name D-Arabinose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ara5p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0100 and as a product in r_0355 and as a modifier in r_0100, r_0355).

$$\frac{\text{d}}{\text{d}t}\text{s\_0611} = v_{103} - v_{23} \tag{978}$$

7.178 Species s_0620

Name D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_eig3p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0785 and as a product in r_0784 and as a modifier in r_0784, r_0785).

$$\frac{\text{d}}{\text{d}t}\text{s\_0620} = v_{205} - v_{206} \tag{979}$$

7.179 Species s_0621

Name D-Erythrose 4-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_e4p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0101, r_0574, r_1356 and as a product in r_1358 and as a modifier in r_0101, r_0574, r_1356, r_1358).

$$\frac{\text{d}}{\text{d}t}\text{s\_0621} = v_{339} - v_{24} - v_{155} - v_{337} \tag{980}$$

7.180 Species s_0622

Name D-Fructose

SBO:0000247 simple chemical

Notes iJO1366:M_fru_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0761, r_1714 and as a product in r_1432 and as a modifier in r_0761, r_1432, r_1714).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0622} = v_{364} - v_{195} - v_{376} \tag{981}$$

7.181 Species s_0627

Name D-Fructose 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_f6p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0684, r_1356, r_1358 and as a product in r_0664, r_0761, r_1714 and as a modifier in r_0664, r_0684, r_0761, r_1356, r_1358, r_1714).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0627} = v_{168} + v_{195} + v_{376} - v_{176} - v_{337} - v_{339} \tag{982}$$

7.182 Species s_0653

Name D-Glucosamine 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_gam1p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0658 and as a product in r_1150 and as a modifier in r_0658, r_1150).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0653} = v_{272} - v_{166} \tag{983}$$

7.183 Species s_0654

Name D-Glucosamine 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_gam6p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1150 and as a product in r_0684 and as a modifier in r_0684, r_1150).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0654} = v_{176} - v_{272} \tag{984}$$

7.184 Species s_0657

Name D-Glucose

SBO:0000247 simple chemical

Notes iJO1366:M_glc_DASH_D_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0762, r_1432, r_1622 and as a product in r_1621 and as a modifier in r_0762, r_1432, r_1621, r_1622).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0657} = v_{374} - v_{196} - v_{364} - v_{375} \tag{985}$$

7.185 Species s_0659

Name D-Glucose

SBO:0000247 simple chemical

Notes iJO1366:M_glc_DASH_D_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1621 and as a modifier in r_1621), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0659} = 0 \tag{986}$$

7.186 Species s_0663

Name D-Glucose 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_g6p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0660, r_0664 and as a product in r_0762, r_1622 and as a modifier in r_0660, r_0664, r_0762, r_1622).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0663} = v_{196} + v_{375} - v_{167} - v_{168} \tag{987}$$

7.187 Species s_0671

Name D-Glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_glu_DASH_D_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1399 and as a product in r_0676 and as a modifier in r_0676, r_1399).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0671} = v_{171} - v_{353} \tag{988}$$

7.188 Species s_0675

Name D-Glycerate 2-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2pg_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0538 and as a product in r_0697, r_1153 and as a modifier in r_0538, r_0697, r_1153).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0675} = v_{180} + v_{275} - v_{151} \tag{989}$$

7.189 Species s_0704

Name D-Ribulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ru5p_DASH_D_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0092, r_0355, r_1284 and as a product in r_1285 and as a modifier in r_0092, r_0355, r_1284, r_1285).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0704} = v_{314} - v_{19} - v_{103} - v_{313} \tag{990}$$

7.190 Species s_0721

Name D-Xylulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_xu5p_DASH_D_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1285 and as a product in r_1357, r_1358 and as a modifier in r_1285, r_1357, r_1358).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0721} = v_{338} + v_{339} - v_{314} \tag{991}$$

7.191 Species s_0726

Name dATP

SBO:0000247 simple chemical

Notes iJO1366:M_datp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1276 and as a modifier in r_1276, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0726} = v_{309} - 0.02617 v_{399} \tag{992}$$

7.192 Species s_0731

Name dCTP

SBO:0000247 simple chemical

Notes iJO1366:M_dctp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1277 and as a modifier in r_1277, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0731} = v_{310} - 0.02702 v_{399} \tag{993}$$

7.193 Species s_0732

Name Deamino-NAD+

SBO:0000247 simple chemical

Notes iJO1366:M_dnad_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1008 and as a product in r_1019 and as a modifier in r_1008, r_1019).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0732} = v_{246} - v_{245} \tag{994}$$

7.194 Species s_0737

Name Decanoyl-CoA (n-C10:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_dcacoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0232 and as a product in r_0267 and as a modifier in r_0232, r_0267).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0737} = v_{87} - v_{72} \tag{995}$$

7.195 Species s_0738

Name dehydroglycine

SBO:0000247 simple chemical

Notes iJO1366:M_dhgly_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1346 and as a product in r_1375 and as a modifier in r_1346, r_1375).

$$\frac{\text{d}}{\text{d}t}\text{s\_0738} = v_{343} - v_{332} \tag{996}$$

7.196 Species s_0754

Name Dephospho-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_dpcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0488 and as a product in r_1074 and as a modifier in r_0488, r_1074).

$$\frac{\text{d}}{\text{d}t}\text{s\_0754} = v_{260} - v_{131} \tag{997}$$

7.197 Species s_0755

Name Dethiobiotin

SBO:0000247 simple chemical

Notes iJO1366:M_dtbt_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0383 and as a product in r_0489 and as a modifier in r_0383, r_0489).

$$\frac{\text{d}}{\text{d}t}\text{s\_0755} = v_{132} - v_{113} \tag{998}$$

7.198 Species s_0760

Name dGTP

SBO:0000247 simple chemical

Notes iJO1366:M_dgtp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1278 and as a modifier in r_1278, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0760} = v_{311} - 0.02702 v_{399} \tag{999}$$

7.199 Species s_0765

Name Dihydroneopterin

SBO:0000247 simple chemical

Notes iJO1366:M_dhnpt_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0507 and as a product in r_2310 and as a modifier in r_0507, r_2310).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0765} = v_{392} - v_{141} \tag{1000}$$

7.200 Species s_0766

Name Dihydroneopterin monophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dhpmp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2310 and as a product in r_0510 and as a modifier in r_0510, r_2310).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0766} = v_{142} - v_{392} \tag{1001}$$

7.201 Species s_0767

Name Dihydropteroate

SBO:0000247 simple chemical

Notes iJO1366:M_dhpt_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0505 and as a product in r_0515 and as a modifier in r_0505, r_0515).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0767} = v_{145} - v_{140} \tag{1002}$$

7.202 Species s_0768

Name dihydrosirohydrochlorin

SBO:0000247 simple chemical

Notes iJO1366:M_dscl_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1306 and as a product in r_1422 and as a modifier in r_1306, r_1422).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0768} = v_{361} - v_{320} \tag{1003}$$

7.203 Species s_0772

Name Dihydroxyacetone phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dhap_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0712, r_1259 and as a product in r_1363 and as a modifier in r_0712, r_1259, r_1363).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0772} = v_{340} - v_{183} - v_{305} \tag{1004}$$

7.204 Species s_0779

Name Dimethylallyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dmpp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0522 and as a product in r_0014 and as a modifier in r_0014, r_0522).

$$\frac{\text{d}}{\text{d}t}\text{s\_0779} = v_7 - v_{148} \tag{1005}$$

7.205 Species s_0783

Name Diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ppi_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 87 reactions (as a reactant in r_1222 and as a product in r_0054, r_0105, r_0257, r_0259, r_0260, r_0348, r_0361, r_0365, r_0374, r_0385, r_0386, r_0418, r_0419, r_0445, r_0510, r_0515, r_0522, r_0533, r_0611, r_0655, r_0682, r_0687, r_0741, r_0745, r_0775, r_0951, r_0965, r_0969, r_1008, r_1019, r_1021, r_1063, r_1067, r_1074, r_1076, r_1200, r_1205, r_1329, r_1344, r_1346, r_1392, r_1410, r_2584 and as a modifier in r_0054, r_0105, r_0257, r_0259, r_0260, r_0348, r_0361, r_0365, r_0374, r_0385, r_0386, r_0418, r_0419, r_0445, r_0510, r_0515, r_0522, r_0533, r_0611, r_0655, r_0682, r_0687, r_0741, r_0745, r_0775, r_0951, r_0965, r_0969, r_1008, r_1019, r_1021, r_1063, r_1067, r_1074, r_1076, r_1200, r_1205, r_1222, r_1329, r_1344, r_1346, r_1392, r_1410).

$$\begin{aligned}\frac{\text{d}}{\text{d}t}\text{s\_0783} = {} & v_{11} + v_{27} + v_{83} + v_{84} + v_{85} + v_{101} + v_{105} + v_{106} + v_{112} + v_{115} + v_{116} + v_{118} \\ & + v_{119} + v_{126} + v_{142} + v_{145} + v_{148} + v_{150} + v_{161} + v_{165} + v_{174} + v_{178} + v_{190} \\ & + v_{192} + v_{203} + v_{233} + v_{238} + v_{240} + v_{245} + v_{246} + v_{247} + 5v_{255} + v_{258} + v_{260} \\ & + v_{262} + v_{277} + v_{281} + v_{325} + v_{330} + v_{332} + v_{350} + 8v_{358} + 0.7739v_{399} - v_{294}\end{aligned} \tag{1006}$$

7.206 Species s_0785

Name Dodecanoate (n-C12:0)

SBO:0000247 simple chemical

Notes iJO1366:M_ddca_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0257 and as a product in r_0579 and as a modifier in r_0257, r_0579).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0785} = v_{157} - v_{83} \tag{1007}$$

7.207 Species s_0789

Name Dodecanoyl-ACP (n-C12:0ACP)

SBO:0000247 simple chemical

Notes iJO1366:M_ddcaACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0166 and as a product in r_0257 and as a modifier in r_0166, r_0257).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0789} = v_{83} - v_{53} \tag{1008}$$

7.208 Species s_0790

Name Dodecanoyl-CoA (n-C12:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_ddcacoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0233, r_0579 and as a product in r_0268 and as a modifier in r_0233, r_0268, r_0579).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0790} = v_{88} - v_{73} - v_{157} \tag{1009}$$

7.209 Species s_0795

Name dTDP

SBO:0000247 simple chemical

Notes iJO1366:M_dtdp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1043 and as a product in r_0532 and as a modifier in r_0532, r_1043).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0795} = v_{149} - v_{249} \tag{1010}$$

7.210 Species s_0802

Name dTMP

SBO:0000247 simple chemical

Notes iJO1366:M_dtmp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0532 and as a product in r_1353 and as a modifier in r_0532, r_1353).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0802} = v_{336} - v_{149} \tag{1011}$$

7.211 Species s_0805

Name dTTP

SBO:0000247 simple chemical

Notes iJO1366:M_dttp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1043 and as a modifier in r_1043, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0805} = v_{249} - 0.02617 v_{399} \tag{1012}$$

7.212 Species s_0807

Name dUMP

SBO:0000247 simple chemical

Notes iJO1366:M_dump_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1353 and as a product in r_0533 and as a modifier in r_0533, r_1353).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0807} = v_{150} - v_{336} \tag{1013}$$

7.213 Species s_0810

Name dUTP

SBO:0000247 simple chemical

Notes iJO1366:M_dutp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0533 and as a product in r_1279 and as a modifier in r_0533, r_1279).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0810} = v_{312} - v_{150} \tag{1014}$$

7.214 Species s_0812

Name Enoylglutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_egmeACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0563 and as a product in r_0145 and as a modifier in r_0145, r_0563).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0812} = v_{46} - v_{152} \tag{1015}$$

7.215 Species s_0813

Name Enoylpimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_epmeACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0564 and as a product in r_0148 and as a modifier in r_0148, r_0564).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0813} = v_{49} - v_{153} \tag{1016}$$

7.216 Species s_0826

Name Farnesyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_frdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1063, r_1410 and as a product in r_0655 and as a modifier in r_0655, r_1063, r_1410).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0826} = v_{165} - v_{255} - v_{358} \tag{1017}$$

7.217 Species s_0838

Name Fe2+

SBO:0000247 simple chemical

Notes iJO1366:M_fe2_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0602, r_0797, r_0798, r_1307, r_2584 and as a product in r_1792 and as a modifier in r_0602, r_0797, r_0798, r_1307, r_1792, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0838} = v_{377} - v_{160} - 2v_{211} - 2v_{212} - v_{321} - 0.006715v_{399} \tag{1018}$$

7.218 Species s_0840

Name Fe2+

SBO:0000247 simple chemical

Notes iJO1366:M_fe2_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1792 and as a modifier in r_1792), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0840} = 0 \tag{1019}$$

7.219 Species s_0841

Name Fe3+

SBO:0000247 simple chemical

Notes iJO1366:M_fe3_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1793 and as a modifier in r_1793, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0841} = v_{378} - 0.007808 v_{399} \tag{1020}$$

7.220 Species s_0843

Name Fe3+

SBO:0000247 simple chemical

Notes iJO1366:M_fe3_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1793 and as a modifier in r_1793), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0843} = 0 \tag{1021}$$

7.221 Species s_0859

Name Flavin adenine dinucleotide oxidized

SBO:0000247 simple chemical

Notes iJO1366:M_fad_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 26 reactions (as a reactant in r_0576, r_2584 and as a product in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0611, r_0797, r_0798, r_0800 and as a modifier in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0576, r_0611, r_0797, r_0798, r_0800, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0859} = v_{86} + v_{87} + v_{88} + v_{89} + v_{90} + v_{91} + v_{92} + v_{161} + v_{211} + v_{212} + v_{214} - v_{156} - 2.23 \cdot 10^{-4} v_{399} \tag{1022}$$

7.222 Species s_0860

Name Flavin adenine dinucleotide reduced

SBO:0000247 simple chemical

Notes iJO1366:M_fadh2_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 22 reactions (as a reactant in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0797, r_0798, r_0800 and as a product in r_0576 and as a modifier in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0576, r_0797, r_0798, r_0800).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0860} = v_{156} - v_{86} - v_{87} - v_{88} - v_{89} - v_{90} - v_{91} - v_{92} - v_{211} - v_{212} - v_{214} \tag{1023}$$

7.223 Species s_0861

Name Flavodoxin reduced

SBO:0000247 simple chemical

Notes iJO1366:M_flxr_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0084, r_1276, r_1277, r_1278, r_1279 and as a product in r_1255 and as a modifier in r_0084, r_1255, r_1276, r_1277, r_1278, r_1279).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0861} = 2v_{304} - 2v_{17} - 2v_{309} - 2v_{310} - 2v_{311} - 2v_{312} \tag{1024}$$

7.224 Species s_0862

Name flavodoxin semi oxidized

SBO:0000247 simple chemical

Notes iJO1366:M_flxso_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_1255 and as a product in r_0084, r_1276, r_1277, r_1278, r_1279 and as a modifier in r_0084, r_1255, r_1276, r_1277, r_1278, r_1279).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0862} = 2v_{17} + 2v_{309} + 2v_{310} + 2v_{311} + 2v_{312} - 2v_{304} \tag{1025}$$

7.225 Species s_0863

Name FMN

SBO:0000247 simple chemical

Notes iJO1366:M_fmn_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0611 and as a product in r_1264 and as a modifier in r_0611, r_1264).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0863} = v_{306} - v_{161} \tag{1026}$$

7.226 Species s_0867

Name Formate

SBO:0000247 simple chemical

Notes iJO1366:M_for_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 14 reactions (as a reactant in r_0622, r_0648 and as a product in r_0092, r_0179, r_0744, r_0745, r_1252 and as a modifier in r_0092, r_0179, r_0622, r_0648, r_0744, r_0745, r_1252).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0867} = v_{19} + 2v_{57} + v_{191} + v_{192} + v_{303} - v_{162} - v_{164} \tag{1027}$$

7.227 Species s_0875

Name Fumarate

SBO:0000247 simple chemical

Notes iJO1366:M_fum_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0632 and as a product in r_0302, r_0304, r_0360 and as a modifier in r_0302, r_0304, r_0360, r_0632).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0875} = v_{96} + v_{98} + v_{104} - v_{163} \tag{1028}$$

7.228 Species s_0896

Name GDP

SBO:0000247 simple chemical

Notes iJO1366:M_gdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_1045 and as a product in r_0303, r_0754, r_1329 and as a modifier in r_0303, r_0754, r_1045, r_1329).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0896} = v_{97} + v_{193} + v_{325} - v_{250} \tag{1029}$$

7.229 Species s_0903

Name Geranyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_grdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0655 and as a product in r_0522 and as a modifier in r_0522, r_0655).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0903} = v_{148} - v_{165} \tag{1030}$$

7.230 Species s_0910

Name Glutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_gmeACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0150 and as a product in r_0563 and as a modifier in r_0150, r_0563).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0910} = v_{152} - v_{51} \tag{1031}$$

7.231 Species s_0913

Name Glyceraldehyde 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_g3p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 16 reactions (as a reactant in r_0009, r_0695, r_1357, r_1358, r_1363 and as a product in r_0056, r_1356, r_1367 and as a modifier in r_0009, r_0056, r_0695, r_1356, r_1357, r_1358, r_1363, r_1367).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0913} = v_{12} + v_{337} + v_{341} - v_{3} - v_{179} - v_{338} - v_{339} - v_{340} \tag{1032}$$

7.232 Species s_0920

Name Glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_glyc3p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0706, r_0707 and as a product in r_0712 and as a modifier in r_0706, r_0707, r_0712).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0920} = v_{183} - v_{181} - v_{182} \tag{1033}$$

7.233 Species s_0929

Name Glycine

SBO:0000247 simple chemical

Notes iJO1366:M_gly_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_1214, r_2584 and as a product in r_0724, r_0726, r_1348 and as a modifier in r_0724, r_0726, r_1214, r_1348, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0929} = v_{184} + v_{185} + v_{334} - v_{289} - 0.6126 v_{399} \tag{1034}$$

7.234 Species s_0936

Name Glycolaldehyde

SBO:0000247 simple chemical

Notes iJO1366:M_gcald_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0731 and as a product in r_0507 and as a modifier in r_0507, r_0731).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0936} = v_{141} - v_{186} \tag{1035}$$

7.235 Species s_0937

Name Glycolate

SBO:0000247 simple chemical

Notes iJO1366:M_glyclt_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0734, r_0735 and as a product in r_0731 and as a modifier in r_0731, r_0734, r_0735).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0937} = v_{186} - v_{187} - v_{188} \tag{1036}$$

7.236 Species s_0941

Name Glyoxylate

SBO:0000247 simple chemical

Notes iJO1366:M_glx_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0739 and as a product in r_0734, r_0735 and as a modifier in r_0734, r_0735, r_0739).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0941} = v_{187} + v_{188} - 2v_{189} \tag{1037}$$

7.237 Species s_0942

Name GMP

SBO:0000247 simple chemical

Notes iJO1366:M_gmp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0754 and as a product in r_0741 and as a modifier in r_0741, r_0754).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0942} = v_{190} - v_{193} \tag{1038}$$

7.238 Species s_0945

Name GTP

SBO:0000247 simple chemical

Notes iJO1366:M_gtp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 20 reactions (as a reactant in r_0303, r_0385, r_0386, r_0445, r_0744, r_0745, r_1278, r_1329, r_2584 and as a product in r_1045 and as a modifier in r_0303, r_0385, r_0386, r_0445, r_0744, r_0745, r_1045, r_1278, r_1329, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0945} = v_{250} - v_{97} - v_{115} - v_{116} - v_{126} - v_{191} - v_{192} - v_{311} - v_{325} - 0.2151v_{399} \tag{1039}$$

7.239 Species s_0971

Name Hexadecanoate (n-C16:0)

SBO:0000247 simple chemical

Notes iJO1366:M_hdca_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0259 and as a product in r_0580 and as a modifier in r_0259, r_0580).

$$\frac{\text{d}}{\text{d}t}\text{s\_0971} = v_{158} - v_{84} \tag{1040}$$

7.240 Species s_0976

Name Hexadecenoate (n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_hdcea_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0260 and as a product in r_0581 and as a modifier in r_0260, r_0581).

$$\frac{\text{d}}{\text{d}t}\text{s\_0976} = v_{159} - v_{85} \tag{1041}$$

7.241 Species s_0979

Name Hexadecenoyl-CoA (n-C16:1CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_hdcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0581 and as a product in r_0096 and as a modifier in r_0096, r_0581).

$$\frac{\text{d}}{\text{d}t}\text{s\_0979} = v_{20} - v_{159} \tag{1042}$$

7.242 Species s_0984

Name Hexanoyl-CoA (n-C6:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_hxcoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0234 and as a product in r_0270 and as a modifier in r_0234, r_0270).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0984} = v_{90} - v_{74} \tag{1043}$$

7.243 Species s_0991

Name Hydrogen peroxide

SBO:0000247 simple chemical

Notes iJO1366:M_h2o2_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0928 and as a product in r_0829 and as a modifier in r_0829, r_0928).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0991} = v_{222} - v_{229} \tag{1044}$$

7.244 Species s_0994

Name Hydrogen sulfide

SBO:0000247 simple chemical

Notes iJO1366:M_h2s_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0452 and as a product in r_1330 and as a modifier in r_0452, r_1330).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_0994} = v_{326} - v_{128} \tag{1045}$$

7.245 Species s_0998

Name Hydroxymethylbilane

SBO:0000247 simple chemical

Notes iJO1366:M_hmbil_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1423 and as a product in r_0777 and as a modifier in r_0777, r_1423).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_0998} = v_{204} - v_{362} \tag{1046}$$

7.246 Species s_1005

Name Iminoaspartate

SBO:0000247 simple chemical

Notes iJO1366:M_iasp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1259 and as a product in r_0829 and as a modifier in r_0829, r_1259).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1005} = v_{222} - v_{305} \tag{1047}$$

7.247 Species s_1006

Name IMP

SBO:0000247 simple chemical

Notes iJO1366:M_imp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0303, r_0787 and as a product in r_0786 and as a modifier in r_0303, r_0786, r_0787).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1006} = v_{207} - v_{97} - v_{208} \tag{1048}$$

7.248 Species s_1009

Name Indole

SBO:0000247 simple chemical

Notes iJO1366:M_indole_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1368 and as a product in r_1367 and as a modifier in r_1367, r_1368).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1009} = v_{341} - v_{342} \tag{1049}$$

7.249 Species s_1017

Name IscS sulfur acceptor protein

SBO:0000247 simple chemical

Notes iJO1366:M_iscs_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0802 and as a product in r_0796, r_0797, r_0798, r_0963, r_1346 and as a modifier in r_0796, r_0797, r_0798, r_0802, r_0963, r_1346).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1017} = v_{210} + 2v_{211} + 2v_{212} + v_{236} + v_{332} - v_{216} \tag{1050}$$

7.250 Species s_1018

Name IscS with bound sulfur

SBO:0000247 simple chemical

Notes iJO1366:M_iscssh_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0796, r_0797, r_0798, r_0963, r_1346 and as a product in r_0802 and as a modifier in r_0796, r_0797, r_0798, r_0802, r_0963, r_1346).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1018} = v_{216} - v_{210} - 2v_{211} - 2v_{212} - v_{236} - v_{332} \tag{1051}$$

7.251 Species s_1019

Name IscU scaffold protein

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0796, r_0797 and as a product in r_0799, r_0801 and as a modifier in r_0796, r_0797, r_0799, r_0801).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1019} = v_{213} + v_{215} - v_{210} - v_{211} \tag{1052}$$

7.252 Species s_1020

Name IscU with bound [2Fe-2S] cluster

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_DASH_2fe2s_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0798, r_0799 and as a product in r_0796, r_0797 and as a modifier in r_0796, r_0797, r_0798, r_0799).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1020} = v_{210} + v_{211} - v_{212} - v_{213} \tag{1053}$$

7.253 Species s_1021

Name IscU with bound [4Fe-4S] cluster

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_DASH_4fe4s_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0801 and as a product in r_0800 and as a modifier in r_0800, r_0801).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1021} = v_{214} - v_{215} \tag{1054}$$

7.254 Species s_1022

Name IscU with two bound [2Fe-2S] clusters

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_DASH_2fe2s2_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0800 and as a product in r_0798 and as a modifier in r_0798, r_0800).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1022} = v_{212} - v_{214} \tag{1055}$$

7.255 Species s_1027

Name Isocitrate

SBO:0000247 simple chemical

Notes iJO1366:M_icit_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0806 and as a product in r_0247 and as a modifier in r_0247, r_0806).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1027} = v_{82} - v_{217} \tag{1056}$$

7.256 Species s_1028

Name Isopentenyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ipdp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0522, r_0655, r_1063, r_1410 and as a product in r_0015 and as a modifier in r_0015, r_0522, r_0655, r_1063, r_1410).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1028} = v_{8} - v_{148} - v_{165} - 5v_{255} - 8v_{358} \tag{1057}$$

7.257 Species s_1033

Name KDO(2)-lipid IV(A)

SBO:0000247 simple chemical

Notes iJO1366:M_kdo2lipid4_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0103 and as a modifier in r_0103, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1033} = v_{26} - 0.01946 v_{399} \tag{1058}$$

7.258 Species s_1038

Name KDO-lipid IV(A)

SBO:0000247 simple chemical

Notes iJO1366:M_kdolipid4_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0103 and as a product in r_0102 and as a modifier in r_0102, r_0103).

$$\frac{\text{d}}{\text{d}t}\text{s\_1038} = v_{25} - v_{26} \tag{1059}$$

7.259 Species s_1040

Name L-2-Amino-3-oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2aobut_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0724 and as a product in r_0848 and as a modifier in r_0724, r_0848).

$$\frac{\text{d}}{\text{d}t}\text{s\_1040} = v_{225} - v_{184} \tag{1060}$$

7.260 Species s_1041

Name L-Alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ala_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0222, r_0310, r_1397, r_2584 and as a product in r_0802, r_0815 and as a modifier in r_0222, r_0310, r_0802, r_0815, r_1397, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1041} = v_{216} + v_{221} - v_{66} - v_{100} - v_{352} - 0.5137v_{399} \tag{1061}$$

7.261 Species s_1061

Name L-Arginine

SBO:0000247 simple chemical

Notes iJO1366:M_arg_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0360 and as a modifier in r_0360, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1061} = v_{104} - 0.2958v_{399} \tag{1062}$$

7.262 Species s_1068

Name L-Asparagine

SBO:0000247 simple chemical

Notes iJO1366:M_asn_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0365 and as a modifier in r_0365, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1068} = v_{106} - 0.2411v_{399} \tag{1063}$$

7.263 Species s_1072

Name L-Aspartate

SBO:0000247 simple chemical

Notes iJO1366:M_asp_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 20 reactions (as a reactant in r_0303, r_0361, r_0365, r_0367, r_0368, r_0369, r_0829, r_1210, r_2584 and as a product in r_0370 and as a modifier in r_0303, r_0361, r_0365, r_0367, r_0368, r_0369, r_0370, r_0829, r_1210, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1072} = v_{110} - v_{97} - v_{105} - v_{106} - v_{107} - v_{108} - v_{109} - v_{222} - v_{286} - 0.2411 v_{399} \quad (1064)$$

7.264 Species s_1075

Name L-Aspartate 4-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_aspsa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0503, r_0769 and as a product in r_0371 and as a modifier in r_0371, r_0503, r_0769).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1075} = v_{111} - v_{138} - v_{200} \quad (1065)$$

7.265 Species s_1081

Name L-Citrulline

SBO:0000247 simple chemical

Notes iJO1366:M_citr_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0361 and as a product in r_1065 and as a modifier in r_0361, r_1065).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1081} = v_{257} - v_{105} \quad (1066)$$

7.266 Species s_1082

Name L-Cystathionine

SBO:0000247 simple chemical

Notes iJO1366:M_cyst_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0450 and as a product in r_1057 and as a modifier in r_0450, r_1057).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1082} = v_{254} - v_{127} \tag{1067}$$

7.267 Species s_1083

Name L-Cysteine

SBO:0000247 simple chemical

Notes iJO1366:M_cys_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0802, r_1057, r_1200, r_2584 and as a product in r_0452 and as a modifier in r_0452, r_0802, r_1057, r_1200, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1083} = v_{128} - v_{216} - v_{254} - v_{277} - 0.09158v_{399} \tag{1068}$$

7.268 Species s_1095

Name L-Glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_glu_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 56 reactions (as a reactant in r_0245, r_0370, r_0505, r_0673, r_0676, r_0683, r_0687, r_0765, r_0808, r_0815, r_0854, r_0999, r_1054, r_1081, r_1217, r_1318, r_1376, r_1425, r_2584 and as a product in r_0181, r_0349, r_0440, r_0675, r_0682, r_0684, r_0741, r_0784, r_1212 and as a modifier in r_0181, r_0245, r_0349, r_0370, r_0440, r_0505, r_0673, r_0675, r_0676, r_0682, r_0683, r_0684, r_0687, r_0741, r_0765, r_0784, r_0808, r_0815, r_0854, r_0999, r_1054, r_1081, r_1212, r_1217, r_1318, r_1376, r_1425, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1095} = v_{58} + v_{102} + v_{125} + v_{170} + v_{174} + v_{176} + v_{190} + v_{205} + v_{288} - v_{80} - v_{110} - v_{140} - v_{169} - v_{171} - v_{175} - v_{178} - v_{199} - v_{218} - v_{221} - v_{226} - v_{243} - v_{253} - v_{263} - v_{291} - v_{324} - v_{344} - v_{363} - 0.2632 v_{399} \tag{1069}$$

7.269 Species s_1098

Name L-Glutamate 1-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_glu1sa_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0678 and as a product in r_0686 and as a modifier in r_0678, r_0686).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1098} = v_{177} - v_{172} \tag{1070}$$

7.270 Species s_1099

Name L-Glutamate 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_glu5p_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0679 and as a product in r_0673 and as a modifier in r_0673, r_0679).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1099} = v_{169} - v_{173} \tag{1071}$$

7.271 Species s_1100

Name L-Glutamate 5-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_glu5sa_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0835 and as a product in r_0679 and as a modifier in r_0679, r_0835).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1100} = v_{173} - v_{223} \tag{1072}$$

7.272 Species s_1101

Name L-Glutamine

SBO:0000247 simple chemical

Notes iJO1366:M_gln_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 20 reactions (as a reactant in r_0181, r_0349, r_0440, r_0682, r_0684, r_0741, r_0784, r_1212, r_2584 and as a product in r_0683 and as a modifier in r_0181, r_0349, r_0440, r_0682, r_0683, r_0684, r_0741, r_0784, r_1212, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1101} = v_{175} - v_{58} - v_{102} - v_{125} - v_{174} - v_{176} - v_{190} - v_{205} - v_{288} - 0.2632v_{399} \quad (1073)$$

7.273 Species s_1105

Name L-Glutamyl-tRNA(Glu)

SBO:0000247 simple chemical

Notes iJO1366:M_glutrna_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0686 and as a product in r_0687 and as a modifier in r_0686, r_0687).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1105} = v_{178} - v_{177} \quad (1074)$$

7.274 Species s_1106

Name L-Histidine

SBO:0000247 simple chemical

Notes iJO1366:M_his_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0763 and as a modifier in r_0763, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1106} = v_{197} - 0.09474v_{399} \quad (1075)$$

7.275 Species s_1109

Name L-Histidinol

SBO:0000247 simple chemical

Notes iJO1366:M_histd_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0763 and as a product in r_0764 and as a modifier in r_0763, r_0764).

$$\frac{\text{d}}{\text{d}t}\text{s\_1109} = v_{198} - v_{197} \tag{1076}$$

7.276 Species s_1110

Name L-Histidinol phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_hisp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0764 and as a product in r_0765 and as a modifier in r_0764, r_0765).

$$\frac{\text{d}}{\text{d}t}\text{s\_1110} = v_{199} - v_{198} \tag{1077}$$

7.277 Species s_1112

Name L-Homocysteine

SBO:0000247 simple chemical

Notes iJO1366:M_hcys_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0954 and as a product in r_0450, r_1291 and as a modifier in r_0450, r_0954, r_1291).

$$\frac{\text{d}}{\text{d}t}\text{s\_1112} = v_{127} + v_{316} - v_{234} \tag{1078}$$

7.278 Species s_1113

Name L-Homoserine

SBO:0000247 simple chemical

Notes iJO1366:M_hom_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0770, r_0771 and as a product in r_0769 and as a modifier in r_0769, r_0770, r_0771).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1113} = v_{200} - v_{201} - v_{202} \tag{1079}$$

7.279 Species s_1119

Name L-Isoleucine

SBO:0000247 simple chemical

Notes iJO1366:M_ile_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0808 and as a modifier in r_0808, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1119} = v_{218} - 0.2905 v_{399} \tag{1080}$$

7.280 Species s_1127

Name L-Leucine

SBO:0000247 simple chemical

Notes iJO1366:M_leu_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0854 and as a modifier in r_0854, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1127} = v_{226} - 0.4505 v_{399} \tag{1081}$$

7.281 Species s_1131

Name L-Lysine

SBO:0000247 simple chemical

Notes iJO1366:M_lys_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0499 and as a modifier in r_0499, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1131} = v_{134} - 0.3432 v_{399} \tag{1082}$$

7.282 Species s_1138

Name L-Malate

SBO:0000247 simple chemical

Notes iJO1366:M_mal_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0925 and as a product in r_0632, r_0928 and as a modifier in r_0632, r_0925, r_0928).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1138} = v_{163} + v_{229} - v_{228} \tag{1083}$$

7.283 Species s_1141

Name L-Methionine

SBO:0000247 simple chemical

Notes iJO1366:M_met_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0951, r_2584 and as a product in r_0383, r_0954, r_1375 and as a modifier in r_0383, r_0951, r_0954, r_1375, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1141} = v_{113} + v_{234} + v_{343} - v_{233} - 0.1537 v_{399} \tag{1084}$$

7.284 Species s_1151

Name L-Phenylalanine

SBO:0000247 simple chemical

Notes iJO1366:M_phe_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1081 and as a modifier in r_1081, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1151} = v_{263} - 0.1853 v_{399} \tag{1085}$$

7.285 Species s_1155

Name L-Proline

SBO:0000247 simple chemical

Notes iJO1366:M_pro_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1250 and as a modifier in r_1250, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1155} = v_{301} - 0.2211 v_{399} \tag{1086}$$

7.286 Species s_1170

Name L-Serine

SBO:0000247 simple chemical

Notes iJO1366:M_ser_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in r_0726, r_1130, r_1131, r_1301, r_2584 and as a product in r_1134 and as a modifier in r_0726, r_1130, r_1131, r_1134, r_1301, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1170} = v_{268} - v_{185} - v_{266} - v_{267} - v_{317} - 0.2158 v_{399} \tag{1087}$$

7.287 Species s_1179

Name L-Threonine

SBO:0000247 simple chemical

Notes iJO1366:M_thr_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0847, r_0848, r_1348, r_2584 and as a product in r_1349 and as a modifier in r_0847, r_0848, r_1348, r_1349, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1179} = v_{335} - v_{224} - v_{225} - v_{334} - 0.2537 v_{399} \tag{1088}$$

7.288 Species s_1185

Name L-Tryptophan

SBO:0000247 simple chemical

Notes iJO1366:M_trp_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1368 and as a modifier in r_1368, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1185} = v_{342} - 0.05684 v_{399} \tag{1089}$$

7.289 Species s_1189

Name L-Tyrosine

SBO:0000247 simple chemical

Notes iJO1366:M_tyr_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1375, r_2584 and as a product in r_1376 and as a modifier in r_1375, r_1376, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1189} = v_{344} - v_{343} - 0.1379 v_{399} \tag{1090}$$

7.290 Species s_1193

Name L-Valine

SBO:0000247 simple chemical

Notes iJO1366:M_val_DASH_L_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1425 and as a modifier in r_1425, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1193} = v_{363} - 0.4232 v_{399} \tag{1091}$$

7.291 Species s_1204

Name Lipid A Disaccharide

SBO:0000247 simple chemical

Notes iJO1366:M_lipidAds_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1337 and as a product in r_0857 and as a modifier in r_0857, r_1337).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1204} = v_{227} - v_{328} \tag{1092}$$

7.292 Species s_1211

Name LL-2,6-Diaminoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_26dap_DASH_LL_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0500 and as a product in r_1316 and as a modifier in r_0500, r_1316).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1211} = v_{323} - v_{135} \tag{1093}$$

7.293 Species s_1212

Name magnesium

SBO:0000247 simple chemical

Notes iJO1366:M_mg2_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1906 and as a modifier in r_1906, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1212} = v_{379} - 0.008675 v_{399} \tag{1094}$$

7.294 Species s_1214

Name magnesium

SBO:0000247 simple chemical

Notes iJO1366:M_mg2_e

Initial concentration $1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1906 and as a modifier in r_1906), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\text{d}}{\text{d}t}\text{s\_1214} = 0 \tag{1095}$$

7.295 Species s_1216

Name Malonyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_malACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_0147, r_0150, r_0166 and as a product in r_0935 and as a modifier in r_0147, r_0150, r_0166, r_0935).

$$\frac{\text{d}}{\text{d}t}\text{s\_1216} = v_{231} - v_{48} - v_{51} - v_{53} \tag{1096}$$

7.296 Species s_1217

Name Malonyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_malcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0934, r_0935 and as a product in r_0237 and as a modifier in r_0237, r_0934, r_0935).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1217} = v_{77} - v_{230} - v_{231} \tag{1097}$$

7.297 Species s_1218

Name malonyl-CoA methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_malcoame_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0147 and as a product in r_0934 and as a modifier in r_0147, r_0934).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1218} = v_{230} - v_{48} \tag{1098}$$

7.298 Species s_1239

Name Menaquinol 8

SBO:0000247 simple chemical

Notes iJO1366:M_mql8_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1581 and as a product in r_0512, r_0735 and as a modifier in r_0512, r_0735, r_1581).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1239} = v_{144} + v_{188} - v_{372} \tag{1099}$$

7.299 Species s_1240

Name Menaquinone 8

SBO:0000247 simple chemical

Notes iJO1366:M_mqn8_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0512, r_0735 and as a product in r_1581 and as a modifier in r_0512, r_0735, r_1581).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1240} = v_{372} - v_{144} - v_{188} \tag{1100}$$

7.300 Species s_1242

Name meso-2,6-Diaminoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_26dap_DASH_M_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0499, r_1400 and as a product in r_0500 and as a modifier in r_0499, r_0500, r_1400).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1242} = v_{135} - v_{134} - v_{354} \tag{1101}$$

7.301 Species s_1248

Name Methanol

SBO:0000247 simple chemical

Notes iJO1366:M_meoh_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1939 and as a product in r_1220 and as a modifier in r_1220, r_1939).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1248} = v_{293} - v_{381} \tag{1102}$$

7.302 Species s_1250

Name Methanol

SBO:0000247 simple chemical

Notes iJO1366:M_meoh_e

Initial concentration $0\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a product in r_1939), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1250} = 0 \tag{1103}$$

7.303 Species s_1255

Name Mn2+

SBO:0000247 simple chemical

Notes iJO1366:M_mn2_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1923 and as a modifier in r_1923, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1255} = v_{380} - 6.91 \cdot 10^{-4} v_{399} \tag{1104}$$

7.304 Species s_1257

Name Mn2+

SBO:0000247 simple chemical

Notes iJO1366:M_mn2_e

Initial concentration $1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1923 and as a modifier in r_1923), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1257} = 0 \tag{1105}$$

7.305 Species s_1258

Name MoaD Protein with bound AMP

SBO:0000247 simple chemical

Notes iJO1366:M_moadamp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0963 and as a product in r_0969 and as a modifier in r_0963, r_0969).

$$\frac{\text{d}}{\text{d}t}\text{s\_1258} = v_{240} - v_{236} \tag{1106}$$

7.306 Species s_1259

Name MoaD Protein with carboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_moadcoo_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0969 and as a product in r_0968 and as a modifier in r_0968, r_0969).

$$\frac{\text{d}}{\text{d}t}\text{s\_1259} = 2v_{239} - v_{240} \tag{1107}$$

7.307 Species s_1260

Name MoaD Protein with thiocarboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_moadcosh_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0968 and as a product in r_0963 and as a modifier in r_0963, r_0968).

$$\frac{\text{d}}{\text{d}t}\text{s\_1260} = v_{236} - 2v_{239} \tag{1108}$$

7.308 Species s_1261

Name Molybdate

SBO:0000247 simple chemical

Notes iJO1366:M_mobd_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0964, r_2584 and as a product in r_1943 and as a modifier in r_0964, r_1943, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1261} = v_{382} - v_{237} - 7 \cdot 10^{-6} v_{399} \tag{1109}$$

7.309 Species s_1263

Name Molybdate

SBO:0000247 simple chemical

Notes iJO1366:M_mobd_e

Initial concentration $1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1943 and as a modifier in r_1943), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1263} = 0 \tag{1110}$$

7.310 Species s_1264

Name molybdenum cofactor

SBO:0000247 simple chemical

Notes iJO1366:M_moco_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0384 and as a product in r_0964 and as a modifier in r_0384, r_0964).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1264} = v_{237} - v_{114} \tag{1111}$$

7.311 Species s_1265

Name molybdopterin

SBO:0000247 simple chemical

Notes iJO1366:M_mpt_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0965 and as a product in r_0968 and as a modifier in r_0965, r_0968).

$$\frac{\text{d}}{\text{d}t}\text{s\_1265} = v_{239} - v_{238} \tag{1112}$$

7.312 Species s_1274

Name N(omega)-(L-Arginino)succinate

SBO:0000247 simple chemical

Notes iJO1366:M_argsuc_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0360 and as a product in r_0361 and as a modifier in r_0360, r_0361).

$$\frac{\text{d}}{\text{d}t}\text{s\_1274} = v_{105} - v_{104} \tag{1113}$$

7.313 Species s_1277

Name N-((R)-4-Phosphopantothenoyl)-L-cysteine

SBO:0000247 simple chemical

Notes iJO1366:M_4ppcys_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1201 and as a product in r_1200 and as a modifier in r_1200, r_1201).

$$\frac{\text{d}}{\text{d}t}\text{s\_1277} = v_{277} - v_{278} \tag{1114}$$

7.314 Species s_1278

Name N-(5-Phospho-D-ribosyl)anthranilate

SBO:0000247 simple chemical

Notes iJO1366:M_pran_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1211 and as a product in r_0348 and as a modifier in r_0348, r_1211).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1278} = v_{101} - v_{287} \tag{1115}$$

7.315 Species s_1287

Name N-Acetyl-D-glucosamine 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_acgam1p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1392 and as a product in r_0658 and as a modifier in r_0658, r_1392).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1287} = v_{166} - v_{350} \tag{1116}$$

7.316 Species s_1302

Name N-Acetyl-L-glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_acglu_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0243 and as a product in r_0999 and as a modifier in r_0243, r_0999).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1302} = v_{243} - v_{78} \tag{1117}$$

7.317 Species s_1303

Name N-Acetyl-L-glutamate 5-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_acg5sa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0245 and as a product in r_0996 and as a modifier in r_0245, r_0996).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1303} = v_{242} - v_{80} \tag{1118}$$

7.318 Species s_1304

Name N-Acetyl-L-glutamyl 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_acg5p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0996 and as a product in r_0243 and as a modifier in r_0243, r_0996).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1304} = v_{78} - v_{242} \tag{1119}$$

7.319 Species s_1312

Name N-Carbamoyl-L-aspartate

SBO:0000247 simple chemical

Notes iJO1366:M_cbasp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0511 and as a product in r_0368 and as a modifier in r_0368, r_0511).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1312} = v_{108} - v_{143} \tag{1120}$$

7.320 Species s_1315

Name N-Succinyl-2-L-amino-6-oxoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_sl2a6o_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1318 and as a product in r_1338 and as a modifier in r_1318, r_1338).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1315} = v_{329} - v_{324} \tag{1121}$$

7.321 Species s_1316

Name N-Succinyl-LL-2,6-diaminoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_sl26da_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1316 and as a product in r_1318 and as a modifier in r_1316, r_1318).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1316} = v_{324} - v_{323} \tag{1122}$$

7.322 Species s_1318

Name N1-(5-Phospho-D-ribosyl)glycinamide

SBO:0000247 simple chemical

Notes iJO1366:M_gar_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0648 and as a product in r_1214 and as a modifier in r_0648, r_1214).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1318} = v_{289} - v_{164} \tag{1123}$$

7.323 Species s_1321

Name N2-Acetyl-L-ornithine

SBO:0000247 simple chemical

Notes iJO1366:M_acorn_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0244 and as a product in r_0245 and as a modifier in r_0244, r_0245).

$$\frac{\text{d}}{\text{d}t}\text{s\_1321} = v_{80} - v_{79} \tag{1124}$$

7.324 Species s_1322

Name N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide

SBO:0000247 simple chemical

Notes iJO1366:M_fgam_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1212 and as a product in r_0648 and as a modifier in r_0648, r_1212).

$$\frac{\text{d}}{\text{d}t}\text{s\_1322} = v_{164} - v_{288} \tag{1125}$$

7.325 Species s_1327

Name N6-(1,2-Dicarboxyethyl)-AMP

SBO:0000247 simple chemical

Notes iJO1366:M_dcamp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0304 and as a product in r_0303 and as a modifier in r_0303, r_0304).

$$\frac{\text{d}}{\text{d}t}\text{s\_1327} = v_{97} - v_{98} \tag{1126}$$

7.326 Species s_1329

Name nickel

SBO:0000247 simple chemical

Notes iJO1366:M_ni2_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1968 and as a modifier in r_1968, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1329} = v_{385} - 3.23 \cdot 10^{-4} v_{399} \tag{1127}$$

7.327 Species s_1331

Name nickel

SBO:0000247 simple chemical

Notes iJO1366:M_ni2_e

Initial concentration $1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_1968 and as a modifier in r_1968), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1331} = 0 \tag{1128}$$

7.328 Species s_1333

Name Nicotinamide adenine dinucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_nad_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in 70 reactions (as a reactant in r_0139, r_0179, r_0224, r_0573, r_0574, r_0695, r_0731, r_0763, r_0787, r_0848, r_0925, r_1006, r_1151, r_1225, r_1245, r_1251, r_1306, r_2195, r_2519, r_2584 and as a product in r_0014, r_0015, r_0128, r_0129, r_0130, r_0131, r_0133, r_0134, r_0135, r_0211, r_0576, r_0963, r_1008, r_1335, r_1962 and as a modifier in r_0014, r_0015, r_0128, r_0129, r_0130, r_0131, r_0133, r_0134, r_0135, r_0139, r_0179, r_0211, r_0224, r_0573, r_0574, r_0576, r_0695, r_0731, r_0763, r_0787, r_0848, r_0925, r_0963, r_1006, r_1008, r_1151, r_1225, r_1245, r_1251, r_1306, r_1335, r_1962, r_2195, r_2519, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1333} = v_7 + v_8 + v_{36} + v_{37} + v_{38} + v_{39} + v_{40} + v_{41} + v_{42} + v_{61} + v_{156} + v_{236} + v_{245} + v_{327} + v_{384} - v_{44} - v_{57} - v_{67} - v_{154} - v_{155} - v_{179} - v_{186} - 2v_{197} - v_{208} - v_{225} - v_{228} - v_{244} - v_{273} - v_{297} - v_{300} - v_{302} - v_{320} - v_{391} - v_{393} - 0.001831v_{399} \quad (1129)$$

7.329 Species s_1334

Name Nicotinamide adenine dinucleotide - reduced

SBO:0000247 simple chemical

Notes iJO1366:M_nadh_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 64 reactions (as a reactant in r_0014, r_0015, r_0128, r_0129, r_0130, r_0131, r_0133, r_0134, r_0135, r_0211, r_0576, r_0963, r_1335, r_1962 and as a product in r_0139, r_0179, r_0224, r_0573, r_0574, r_0695, r_0731, r_0763, r_0787, r_0848, r_0925, r_1151, r_1225, r_1245, r_1251, r_1306, r_2195, r_2519 and as a modifier in r_0014, r_0015, r_0128, r_0129, r_0130, r_0131, r_0133, r_0134, r_0135, r_0139, r_0179, r_0211, r_0224, r_0573, r_0574, r_0576, r_0695, r_0731, r_0763, r_0787, r_0848, r_0925, r_0963, r_1151, r_1225, r_1245, r_1251, r_1306, r_1335, r_1962, r_2195, r_2519).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1334} = v_{44} + v_{57} + v_{67} + v_{154} + v_{155} + v_{179} + v_{186} + 2v_{197} + v_{208} + v_{225} + v_{228} + v_{273} + v_{297} + v_{300} + v_{302} + v_{320} + v_{391} + v_{393} - v_7 - v_8 - v_{36} - v_{37} - v_{38} - v_{39} - v_{40} - v_{41} - v_{42} - v_{61} - v_{156} - v_{236} - v_{327} - v_{384} \quad (1130)$$

7.330 Species s_1335

Name Nicotinamide adenine dinucleotide phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_nadp_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 64 reactions (as a reactant in r_0660, r_0806, r_0957, r_1962, r_2584 and as a product in r_0011, r_0063, r_0146, r_0149, r_0154, r_0212, r_0371, r_0502, r_0504, r_0563, r_0564, r_0675, r_0679, r_0686, r_0712, r_0769, r_0811, r_0812, r_0996, r_1006, r_1250, r_1304, r_1330, r_1346, r_1347, r_1375, r_1388 and as a modifier in r_0011, r_0063, r_0146, r_0149, r_0154, r_0212, r_0371, r_0502, r_0504, r_0563, r_0564, r_0660, r_0675, r_0679, r_0686, r_0712, r_0769, r_0806, r_0811, r_0812, r_0957, r_0996, r_1006, r_1250, r_1304, r_1330, r_1346, r_1347, r_1375, r_1388, r_1962, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1335} = v_4 + v_{13} + v_{47} + v_{50} + v_{52} + v_{62} + v_{111} + v_{137} + v_{139} + v_{152} + v_{153} + v_{170} + v_{173} + v_{177} + v_{183} + v_{200} + v_{219} + v_{220} + v_{242} + v_{244} + v_{301} + v_{318} + 3v_{326} + v_{332} + v_{333} + v_{343} + v_{347} - v_{167} - v_{217} - v_{235} - v_{384} - 4.47 \cdot 10^{-4} v_{399} \tag{1131}$$

7.331 Species s_1336

Name Nicotinamide adenine dinucleotide phosphate - reduced

SBO:0000247 simple chemical

Notes iJO1366:M_nadph_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in 60 reactions (as a reactant in r_0011, r_0063, r_0146, r_0149, r_0154, r_0212, r_0371, r_0502, r_0504, r_0563, r_0564, r_0675, r_0679, r_0686, r_0712, r_0769, r_0811, r_0812, r_0996, r_1250, r_1304, r_1330, r_1346, r_1347, r_1375, r_1388 and as a product in r_0660, r_0806, r_0957, r_1962 and as a modifier in r_0011, r_0063, r_0146, r_0149, r_0154, r_0212, r_0371, r_0502, r_0504, r_0563, r_0564, r_0660, r_0675, r_0679, r_0686, r_0712, r_0769, r_0806, r_0811, r_0812, r_0957, r_0996, r_1250, r_1304, r_1330, r_1346, r_1347, r_1375, r_1388, r_1962).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1336} = v_{167} + v_{217} + v_{235} + v_{384} - v_4 - v_{13} - v_{47} - v_{50} - v_{52} - v_{62} - v_{111} - v_{137} - v_{139} - v_{152} - v_{153} - v_{170} - v_{173} - v_{177} - v_{183} - v_{200} - v_{219} - v_{220} - v_{242} - v_{301} - v_{318} - 3v_{326} - v_{332} - v_{333} - v_{343} - v_{347} \tag{1132}$$

7.332 Species s_1340

Name Nicotinate D-ribonucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_nicrnt_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1019 and as a product in r_1021 and as a modifier in r_1019, r_1021).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1340} = v_{247} - v_{246} \tag{1133}$$

7.333 Species s_1358

Name O-Acetyl-L-serine

SBO:0000247 simple chemical

Notes iJO1366:M_acser_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0452 and as a product in r_1301 and as a modifier in r_0452, r_1301).

$$\frac{\text{d}}{\text{d}t}\text{s\_1358} = v_{317} - v_{128} \tag{1134}$$

7.334 Species s_1362

Name O-Phospho-4-hydroxy-L-threonine

SBO:0000247 simple chemical

Notes iJO1366:M_phthr_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1245 and as a product in r_1054 and as a modifier in r_1054, r_1245).

$$\frac{\text{d}}{\text{d}t}\text{s\_1362} = v_{253} - v_{300} \tag{1135}$$

7.335 Species s_1363

Name O-Phospho-L-homoserine

SBO:0000247 simple chemical

Notes iJO1366:M_phom_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1349 and as a product in r_0770 and as a modifier in r_0770, r_1349).

$$\frac{\text{d}}{\text{d}t}\text{s\_1363} = v_{201} - v_{335} \tag{1136}$$

7.336 Species s_1364

Name O-Phospho-L-serine

SBO:0000247 simple chemical

Notes iJO1366:M_pser_DASH_L_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1134 and as a product in r_1217 and as a modifier in r_1134, r_1217).

$$\frac{\text{d}}{\text{d}t}\text{s\_1364} = v_{291} - v_{268} \tag{1137}$$

7.337 Species s_1367

Name O-Succinyl-L-homoserine

SBO:0000247 simple chemical

Notes iJO1366:M_suchms_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1057 and as a product in r_0771 and as a modifier in r_0771, r_1057).

$$\frac{\text{d}}{\text{d}t}\text{s\_1367} = v_{202} - v_{254} \tag{1138}$$

7.338 Species s_1372

Name O2

SBO:0000247 simple chemical

Notes iJO1366:M_o2_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in r_0436, r_0829, r_1230, r_1581, r_1582 and as a product in r_0928, r_2002 and as a modifier in r_0436, r_0829, r_0928, r_1230, r_1581, r_1582, r_2002).

$$\frac{\text{d}}{\text{d}t}\text{s\_1372} = v_{229} + v_{386} - v_{124} - v_{222} - 1.5v_{298} - 0.5v_{372} - 0.5v_{373} \tag{1139}$$

7.339 Species s_1374

Name O2

SBO:0000247 simple chemical

Notes iJO1366:M_o2_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_2002 and as a modifier in r_2002), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1374} = 0 \tag{1140}$$

7.340 Species s_1390

Name Octanoyl-CoA (n-C8:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_occoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0235 and as a product in r_0272 and as a modifier in r_0235, r_0272).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1390} = v_{91} - v_{75} \tag{1141}$$

7.341 Species s_1391

Name Ornithine

SBO:0000247 simple chemical

Notes iJO1366:M_orn_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1065 and as a product in r_0244 and as a modifier in r_0244, r_1065).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1391} = v_{79} - v_{257} \tag{1142}$$

7.342 Species s_1394

Name Orotate

SBO:0000247 simple chemical

Notes iJO1366:M_orot_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1067 and as a product in r_0501, r_0512 and as a modifier in r_0501, r_0512, r_1067).

$$\frac{\text{d}}{\text{d}t}\text{s\_1394} = v_{136} + v_{144} - v_{258} \tag{1143}$$

7.343 Species s_1397

Name Orotidine 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_orot5p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1068 and as a product in r_1067 and as a modifier in r_1067, r_1068).

$$\frac{\text{d}}{\text{d}t}\text{s\_1397} = v_{258} - v_{259} \tag{1144}$$

7.344 Species s_1399

Name Oxaloacetate

SBO:0000247 simple chemical

Notes iJO1366:M_oaa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0370, r_0428, r_0928 and as a product in r_0925, r_1141 and as a modifier in r_0370, r_0428, r_0925, r_0928, r_1141).

$$\frac{\text{d}}{\text{d}t}\text{s\_1399} = v_{228} + v_{271} - v_{110} - v_{123} - v_{229} \tag{1145}$$

7.345 Species s_1406

Name Oxidized thioredoxin

SBO:0000247 simple chemical

Notes iJO1366:M_trdox_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1347 and as a product in r_1139 and as a modifier in r_1139, r_1347).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1406} = v_{270} - v_{333} \tag{1146}$$

7.346 Species s_1407

Name p-Cresol

SBO:0000247 simple chemical

Notes iJO1366:M_4crsol_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2537 and as a product in r_1375 and as a modifier in r_1375, r_2537).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1407} = v_{343} - v_{397} \tag{1147}$$

7.347 Species s_1411

Name Palmitoyl-ACP (n-C16:0ACP)

SBO:0000247 simple chemical

Notes iJO1366:M_palmACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0013, r_0706 and as a product in r_0259 and as a modifier in r_0013, r_0259, r_0706).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1411} = v_{84} - v_{6} - v_{181} \tag{1148}$$

7.348 Species s_1412

Name Palmitoyl-CoA (n-C16:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_pmtcoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0580 and as a product in r_0269 and as a modifier in r_0269, r_0580).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1412} = v_{89} - v_{158} \tag{1149}$$

7.349 Species s_1413

Name Pantetheine 4'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pan4p_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1074 and as a product in r_1201 and as a modifier in r_1074, r_1201).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1413} = v_{278} - v_{260} \tag{1150}$$

7.350 Species s_1429

Name Phenylpyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_phpyr_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1081 and as a product in r_1224 and as a modifier in r_1081, r_1224).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1429} = v_{296} - v_{263} \tag{1151}$$

7.351 Species s_1430

Name Phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pi_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in 105 reactions (as a reactant in r_0695, r_1521 and as a product in r_0085, r_0099, r_0100, r_0101, r_0106, r_0175, r_0237, r_0303, r_0368, r_0371, r_0425, r_0440, r_0463, r_0489, r_0505, r_0622, r_0648, r_0679, r_0683, r_0764, r_0951, r_0996, r_1047, r_1065, r_1134, r_1141, r_1206, r_1208, r_1210, r_1212, r_1214, r_1218, r_1222, r_1232, r_1245, r_1259, r_1265, r_1315, r_1329, r_1349, r_1389, r_1397, r_1399, r_1400, r_1401, r_1413, r_2011, r_2195, r_2310, r_2521, r_2584 and as a modifier in r_0085, r_0099, r_0100, r_0101, r_0106, r_0175, r_0237, r_0303, r_0368, r_0371, r_0425, r_0440, r_0463, r_0489, r_0505, r_0622, r_0648, r_0679, r_0683, r_0695, r_0764, r_0951, r_0996, r_1047, r_1065, r_1134, r_1141, r_1206, r_1208, r_1210, r_1212, r_1214, r_1218, r_1222, r_1232, r_1245, r_1259, r_1265, r_1315, r_1329, r_1349, r_1389, r_1397, r_1399, r_1400, r_1401, r_1413, r_1521, r_2011, r_2195, r_2310, r_2521).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1430} = {} & v_{18}+v_{22}+v_{23}+v_{24}+v_{28}+v_{54}+v_{77}+v_{97}+v_{108}+v_{111}+v_{122}+v_{125}+v_{130}+v_{132}+v_{140}\\ & +v_{162}+v_{164}+v_{173}+v_{175}+v_{198}+v_{233}+v_{242}+v_{252}+v_{257}+v_{268}+v_{271}+v_{282}+v_{284}\\ & +v_{286}+v_{288}+v_{289}+v_{292}+v_{294}+v_{299}+v_{300}+v_{305}+v_{307}+v_{322}+v_{325}+v_{335}+v_{348}\\ & +v_{352}+v_{353}+v_{354}+v_{355}+v_{359}+v_{387}+2v_{391}+v_{392}+v_{394}+53.95v_{399}-v_{179}-v_{366}\end{aligned} \tag{1152}$$

7.352 Species s_1432

Name Phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pi_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_2011 and as a modifier in r_2011), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1432} = 0 \tag{1153}$$

7.353 Species s_1435

Name phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_pe161_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1124 and as a modifier in r_1124, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1435} = v_{265} - 0.07521 v_{399} \tag{1154}$$

7.354 Species s_1437

Name phosphatidylethanolamine (dihexadecanoyl, n-C16:0)

SBO:0000247 simple chemical

Notes iJO1366:M_pe160_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1123 and as a modifier in r_1123, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1437} = v_{264} - 0.06382 v_{399} \tag{1155}$$

7.355 Species s_1476

Name phosphatidylserine (dihexadec-9-enoyl, n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_ps161_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1124 and as a product in r_1131 and as a modifier in r_1124, r_1131).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1476} = v_{267} - v_{265} \tag{1156}$$

7.356 Species s_1477

Name phosphatidylserine (dihexadecanoyl, n-C16:0)

SBO:0000247 simple chemical

Notes iJO1366:M_ps160_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1123 and as a product in r_1130 and as a modifier in r_1123, r_1130).

$$\frac{\text{d}}{\text{d}t}\text{s\_1477} = v_{266} - v_{264} \tag{1157}$$

7.357 Species s_1484

Name Phosphoenolpyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_pep_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 16 reactions (as a reactant in r_0100, r_0101, r_0175, r_1141, r_1389, r_1622, r_1714 and as a product in r_0538 and as a modifier in r_0100, r_0101, r_0175, r_0538, r_1141, r_1389, r_1622, r_1714).

$$\frac{\text{d}}{\text{d}t}\text{s\_1484} = v_{151} - v_{23} - v_{24} - v_{54} - v_{271} - v_{348} - v_{375} - v_{376} \tag{1158}$$

7.358 Species s_1491

Name Pimeloyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_pimACP_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0222 and as a product in r_1220 and as a modifier in r_0222, r_1220).

$$\frac{\text{d}}{\text{d}t}\text{s\_1491} = v_{293} - v_{66} \tag{1159}$$

7.359 Species s_1492

Name Pimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_pmeACP_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1220 and as a product in r_0564 and as a modifier in r_0564, r_1220).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1492} = v_{153} - v_{293} \tag{1160}$$

7.360 Species s_1493

Name Porphobilinogen

SBO:0000247 simple chemical

Notes iJO1366:M_ppbng_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0777 and as a product in r_1223 and as a modifier in r_0777, r_1223).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1493} = v_{295} - 4v_{204} \tag{1161}$$

7.361 Species s_1494

Name potassium

SBO:0000247 simple chemical

Notes iJO1366:M_k_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_2047 and as a modifier in r_2047, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1494} = v_{388} - 0.1952v_{399} \tag{1162}$$

7.362 Species s_1496

Name potassium

SBO:0000247 simple chemical

Notes iJO1366:M_k_e

Initial concentration $1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_2047 and as a modifier in r_2047), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1496} = 0 \tag{1163}$$

7.363 Species s_1497

Name Prephenate

SBO:0000247 simple chemical

Notes iJO1366:M_pphn_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1224, r_1225 and as a product in r_0423 and as a modifier in r_0423, r_1224, r_1225).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1497} = v_{120} - v_{296} - v_{297} \tag{1164}$$

7.364 Species s_1508

Name Protoheme

SBO:0000247 simple chemical

Notes iJO1366:M_pheme_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0602 and as a modifier in r_0602, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1508} = v_{160} - 2.23 \cdot 10^{-4} v_{399} \tag{1165}$$

7.365 Species s_1511

Name Protoporphyrin

SBO:0000247 simple chemical

Notes iJO1366:M_ppp9_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0602 and as a product in r_1230 and as a modifier in r_0602, r_1230).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1511} = v_{298} - v_{160} \tag{1166}$$

7.366 Species s_1512

Name Protoporphyrinogen IX

SBO:0000247 simple chemical

Notes iJO1366:M_pppg9_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1230 and as a product in r_0436 and as a modifier in r_0436, r_1230).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1512} = v_{124} - v_{298} \tag{1167}$$

7.367 Species s_1522

Name Pyridoxal 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pydx5p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_2519 and as a modifier in r_2519, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1522} = v_{393} - 2.23 \cdot 10^{-4} v_{399} \tag{1168}$$

7.368 Species s_1530

Name Pyridoxine 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pdx5p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2519 and as a product in r_1245 and as a modifier in r_1245, r_2519).

$$\frac{\text{d}}{\text{d}t}\text{s\_1530} = v_{300} - v_{393} \tag{1169}$$

7.369 Species s_1531

Name Pyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_pyr_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 32 reactions (as a reactant in r_0009, r_0038, r_0227, r_0503, r_0815, r_1251, r_1252, r_1255, r_1368 and as a product in r_0056, r_0182, r_0349, r_0424, r_0450, r_1622, r_1714 and as a modifier in r_0009, r_0038, r_0056, r_0182, r_0227, r_0349, r_0424, r_0450, r_0503, r_0815, r_1251, r_1252, r_1255, r_1368, r_1622, r_1714).

$$\begin{aligned}\frac{\text{d}}{\text{d}t}\text{s\_1531} = {} & v_{12} + v_{59} + v_{102} + v_{121} + v_{127} + v_{375} + v_{376} - v_3 \\ & - v_9 - 2v_{69} - v_{138} - v_{221} - v_{302} - v_{303} - v_{304} - v_{342}\end{aligned} \tag{1170}$$

7.370 Species s_1537

Name Quinolinate

SBO:0000247 simple chemical

Notes iJO1366:M_quln_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1021 and as a product in r_1259 and as a modifier in r_1021, r_1259).

$$\frac{\text{d}}{\text{d}t}\text{s\_1537} = v_{305} - v_{247} \tag{1171}$$

7.371 Species s_1544

Name Reduced thioredoxin

SBO:0000247 simple chemical

Notes iJO1366:M_trdrd_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1139 and as a product in r_1347 and as a modifier in r_1139, r_1347).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1544} = v_{333} - v_{270} \tag{1172}$$

7.372 Species s_1546

Name Riboflavin

SBO:0000247 simple chemical

Notes iJO1366:M_ribflv_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1264, r_2584 and as a product in r_1266 and as a modifier in r_1264, r_1266, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1546} = v_{308} - v_{306} - 2.23 \cdot 10^{-4} v_{399} \tag{1173}$$

7.373 Species s_1550

Name S-Adenosyl-4-methylthio-2-oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_amob_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2538 and as a product in r_0297 and as a modifier in r_0297, r_2538).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1550} = v_{94} - v_{398} \tag{1174}$$

7.374 Species s_1551

Name S-Adenosyl-L-homocysteine

SBO:0000247 simple chemical

Notes iJO1366:M_ahcys_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1288 and as a product in r_0934, r_1422 and as a modifier in r_0934, r_1288, r_1422).

$$\frac{\text{d}}{\text{d}t}\text{s\_1551} = v_{230} + 2v_{361} - v_{315} \tag{1175}$$

7.375 Species s_1552

Name S-Adenosyl-L-methionine

SBO:0000247 simple chemical

Notes iJO1366:M_amet_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in r_0297, r_0383, r_0934, r_1375, r_1422, r_2584 and as a product in r_0951 and as a modifier in r_0297, r_0383, r_0934, r_0951, r_1375, r_1422, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1552} = v_{233} - v_{94} - v_{113} - v_{230} - v_{343} - 2v_{361} - 2.23 \cdot 10^{-4} v_{399} \tag{1176}$$

7.376 Species s_1558

Name S-Ribosyl-L-homocysteine

SBO:0000247 simple chemical

Notes iJO1366:M_rhcys_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1291 and as a product in r_1288 and as a modifier in r_1288, r_1291).

$$\frac{\text{d}}{\text{d}t}\text{s\_1558} = v_{315} - v_{316} \tag{1177}$$

7.377 Species s_1561

Name Sedoheptulose 7-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_s7p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1357 and as a product in r_1356 and as a modifier in r_1356, r_1357).

$$\frac{\text{d}}{\text{d}t}\text{s\_1561} = v_{337} - v_{338} \tag{1178}$$

7.378 Species s_1571

Name Shikimate

SBO:0000247 simple chemical

Notes iJO1366:M_skm_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1305 and as a product in r_1304 and as a modifier in r_1304, r_1305).

$$\frac{\text{d}}{\text{d}t}\text{s\_1571} = v_{318} - v_{319} \tag{1179}$$

7.379 Species s_1574

Name Shikimate 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_skm5p_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0175 and as a product in r_1305 and as a modifier in r_0175, r_1305).

$$\frac{\text{d}}{\text{d}t}\text{s\_1574} = v_{319} - v_{54} \tag{1180}$$

7.380 Species s_1577

Name Siroheme

SBO:0000247 simple chemical

Notes iJO1366:M_sheme_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1307 and as a modifier in r_1307, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1577} = v_{321} - 2.23 \cdot 10^{-4} v_{399} \tag{1181}$$

7.381 Species s_1578

Name sirohydrochlorin

SBO:0000247 simple chemical

Notes iJO1366:M_scl_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1307 and as a product in r_1306 and as a modifier in r_1306, r_1307).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1578} = v_{320} - v_{321} \tag{1182}$$

7.382 Species s_1595

Name Succinate

SBO:0000247 simple chemical

Notes iJO1366:M_succ_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1315 and as a product in r_1057, r_1316 and as a modifier in r_1057, r_1315, r_1316).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1595} = v_{254} + v_{323} - v_{322} \tag{1183}$$

7.383 Species s_1599

Name Succinyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_succoa_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0771, r_1338 and as a product in r_1315 and as a modifier in r_0771, r_1315, r_1338).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1599} = v_{322} - v_{202} - v_{329} \tag{1184}$$

7.384 Species s_1609

Name Sulfate

SBO:0000247 simple chemical

Notes iJO1366:M_so4_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1329, r_2584 and as a product in r_2108 and as a modifier in r_1329, r_2108, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1609} = v_{389} - v_{325} - 0.004338 v_{399} \tag{1185}$$

7.385 Species s_1611

Name Sulfate

SBO:0000247 simple chemical

Notes iJO1366:M_so4_e

Initial concentration $1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_2108 and as a modifier in r_2108), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1611} = 0 \tag{1186}$$

7.386 Species s_1612

Name Sulfite

SBO:0000247 simple chemical

Notes iJO1366:M_so3_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1330 and as a product in r_1139 and as a modifier in r_1139, r_1330).

$$\frac{\text{d}}{\text{d}t}\text{s\_1612} = v_{270} - v_{326} \tag{1187}$$

7.387 Species s_1632

Name Tetradecanoyl-CoA (n-C14:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_tdcoa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0236 and as a product in r_0273 and as a modifier in r_0236, r_0273).

$$\frac{\text{d}}{\text{d}t}\text{s\_1632} = v_{92} - v_{76} \tag{1188}$$

7.388 Species s_1643

Name Thiamin monophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_thmmp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1345 and as a product in r_1344 and as a modifier in r_1344, r_1345).

$$\frac{\text{d}}{\text{d}t}\text{s\_1643} = v_{330} - v_{331} \tag{1189}$$

7.389 Species s_1644

Name Thiamine diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_thmpp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_1345 and as a modifier in r_1345, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1644} = v_{331} - 2.23 \cdot 10^{-4} v_{399} \tag{1190}$$

7.390 Species s_1668

Name trans-Dec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_dc2coa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0267 and as a product in r_0121 and as a modifier in r_0121, r_0267).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1668} = v_{30} - v_{87} \tag{1191}$$

7.391 Species s_1670

Name trans-Dodec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_dd2coa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0268 and as a product in r_0122 and as a modifier in r_0122, r_0268).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1670} = v_{31} - v_{88} \tag{1192}$$

7.392 Species s_1672

Name trans-Hex-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_hx2coa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0270 and as a product in r_0124 and as a modifier in r_0124, r_0270).

$$\frac{\text{d}}{\text{d}t}\text{s\_1672} = v_{33} - v_{90} \tag{1193}$$

7.393 Species s_1674

Name trans-Hexadec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_hdd2coa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0096, r_0269 and as a product in r_0123 and as a modifier in r_0096, r_0123, r_0269).

$$\frac{\text{d}}{\text{d}t}\text{s\_1674} = v_{32} - v_{20} - v_{89} \tag{1194}$$

7.394 Species s_1676

Name trans-Oct-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_oc2coa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0272 and as a product in r_0126 and as a modifier in r_0126, r_0272).

$$\frac{\text{d}}{\text{d}t}\text{s\_1676} = v_{34} - v_{91} \tag{1195}$$

7.395 Species s_1680

Name trans-Tetradec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_td2coa_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0273 and as a product in r_0127 and as a modifier in r_0127, r_0273).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1680} = v_{35} - v_{92} \tag{1196}$$

7.396 Species s_1690

Name tRNA (Glu)

SBO:0000247 simple chemical

Notes iJO1366:M_trnaglu_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0687 and as a product in r_0686 and as a modifier in r_0686, r_0687).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1690} = v_{177} - v_{178} \tag{1197}$$

7.397 Species s_1719

Name two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of chain)

SBO:0000247 simple chemical

Notes iJO1366:M_murein5px4p_p

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_0970 and as a modifier in r_0970, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1719} = v_{241} - 0.01389 v_{399} \tag{1198}$$

7.398 Species s_1725

Name two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)

SBO:0000247 simple chemical

Notes iJO1366:M_murein5p5p_p

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0970 and as a product in r_1944 and as a modifier in r_0970, r_1944).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1725} = v_{383} - v_{241} \tag{1199}$$

7.399 Species s_1731

Name Ubiquinol-8

SBO:0000247 simple chemical

Notes iJO1366:M_q8h2_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1582 and as a product in r_0501, r_0734 and as a modifier in r_0501, r_0734, r_1582).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1731} = v_{136} + v_{187} - v_{373} \tag{1200}$$

7.400 Species s_1732

Name Ubiquinone-8

SBO:0000247 simple chemical

Notes iJO1366:M_q8_c

Initial concentration $0.1\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0501, r_0734 and as a product in r_1582 and as a modifier in r_0501, r_0734, r_1582).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1732} = v_{373} - v_{136} - v_{187} \tag{1201}$$

7.401 Species s_1733

Name UDP

SBO:0000247 simple chemical

Notes iJO1366:M_udp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_1046 and as a product in r_0857, r_1393, r_1409 and as a modifier in r_0857, r_1046, r_1393, r_1409).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1733} = v_{227} + v_{351} + v_{357} - v_{251} \tag{1202}$$

7.402 Species s_1734

Name UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_u23ga_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_0857, r_1402 and as a product in r_1378 and as a modifier in r_0857, r_1378, r_1402).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1734} = v_{345} - v_{227} - v_{356} \tag{1203}$$

7.403 Species s_1735

Name UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_u3hga_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1378 and as a product in r_1379 and as a modifier in r_1378, r_1379).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1735} = v_{346} - v_{345} \tag{1204}$$

7.404 Species s_1736

Name UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_u3aga_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1379 and as a product in r_1391 and as a modifier in r_1379, r_1391).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1736} = v_{349} - v_{346} \tag{1205}$$

7.405 Species s_1742

Name UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_uaccg_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1388 and as a product in r_1389 and as a modifier in r_1388, r_1389).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1742} = v_{348} - v_{347} \tag{1206}$$

7.406 Species s_1745

Name UDP-N-acetyl-D-glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_uacgam_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_1389, r_1391, r_1393 and as a product in r_1392 and as a modifier in r_1389, r_1391, r_1392, r_1393).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1745} = v_{350} - v_{348} - v_{349} - v_{351} \tag{1207}$$

7.407 Species s_1750

Name UDP-N-acetylmuramate

SBO:0000247 simple chemical

Notes iJO1366:M_uamr_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1397 and as a product in r_1388 and as a modifier in r_1388, r_1397).

$$\frac{\text{d}}{\text{d}t}\text{s\_1750} = v_{347} - v_{352} \tag{1208}$$

7.408 Species s_1751

Name UDP-N-acetylmuramoyl-L-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_uama_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1399 and as a product in r_1397 and as a modifier in r_1397, r_1399).

$$\frac{\text{d}}{\text{d}t}\text{s\_1751} = v_{352} - v_{353} \tag{1209}$$

7.409 Species s_1752

Name UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate

SBO:0000247 simple chemical

Notes iJO1366:M_ugmd_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1401 and as a product in r_1400 and as a modifier in r_1400, r_1401).

$$\frac{\text{d}}{\text{d}t}\text{s\_1752} = v_{354} - v_{355} \tag{1210}$$

7.410 Species s_1754

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_uamag_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1400 and as a product in r_1399 and as a modifier in r_1399, r_1400).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1754} = v_{353} - v_{354} \tag{1211}$$

7.411 Species s_1755

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ugmda_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1137 and as a product in r_1401 and as a modifier in r_1137, r_1401).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1755} = v_{355} - v_{269} \tag{1212}$$

7.412 Species s_1762

Name UMP

SBO:0000247 simple chemical

Notes iJO1366:M_ump_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_1409 and as a product in r_1068, r_1137, r_1402 and as a modifier in r_1068, r_1137, r_1402, r_1409).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{s\_1762} = v_{259} + v_{269} + v_{356} - v_{357} \tag{1213}$$

7.413 Species s_1765

Name Undecaprenyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_udcpdp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in r_1413, r_2584 and as a product in r_1410, r_1944 and as a modifier in r_1410, r_1413, r_1944, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1765} = v_{358} + 2v_{383} - v_{359} - 5.5 \cdot 10^{-5} v_{399} \tag{1214}$$

7.414 Species s_1768

Name Undecaprenyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_udcpp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1137 and as a product in r_1413 and as a modifier in r_1137, r_1413).

$$\frac{\text{d}}{\text{d}t}\text{s\_1768} = v_{359} - v_{269} \tag{1215}$$

7.415 Species s_1776

Name Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopimeloyl-D-ala-D-ala

SBO:0000247 simple chemical

Notes iJO1366:M_uaagmda_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1944 and as a product in r_1393 and as a modifier in r_1393, r_1944).

$$\frac{\text{d}}{\text{d}t}\text{s\_1776} = v_{351} - 2v_{383} \tag{1216}$$

7.416 Species s_1777

Name Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_uagmda_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_1393 and as a product in r_1137 and as a modifier in r_1137, r_1393).

$$\frac{\text{d}}{\text{d}t}\text{s\_1777} = v_{269} - v_{351} \tag{1217}$$

7.417 Species s_1791

Name Uroporphyrinogen III

SBO:0000247 simple chemical

Notes iJO1366:M_uppg3_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in r_1421, r_1422 and as a product in r_1423 and as a modifier in r_1421, r_1422, r_1423).

$$\frac{\text{d}}{\text{d}t}\text{s\_1791} = v_{362} - v_{360} - v_{361} \tag{1218}$$

7.418 Species s_1792

Name UTP

SBO:0000247 simple chemical

Notes iJO1366:M_utp_c

Initial concentration $0.1\ \text{mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in r_0440, r_1279, r_1392, r_2584 and as a product in r_1046 and as a modifier in r_0440, r_1046, r_1279, r_1392, r_2584).

$$\frac{\text{d}}{\text{d}t}\text{s\_1792} = v_{251} - v_{125} - v_{312} - v_{350} - 0.1441 v_{399} \tag{1219}$$

7.419 Species s_1799

Name Xanthosine 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_xmp_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_0741 and as a product in r_0787 and as a modifier in r_0741, r_0787).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1799} = v_{208} - v_{190} \tag{1220}$$

7.420 Species s_1804

Name Zinc

SBO:0000247 simple chemical

Notes iJO1366:M_zn2_c

Initial concentration $0.1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2584 and as a product in r_2167 and as a modifier in r_2167, r_2584).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1804} = v_{390} - 3.41 \cdot 10^{-4} v_{399} \tag{1221}$$

7.421 Species s_1806

Name Zinc

SBO:0000247 simple chemical

Notes iJO1366:M_zn2_e

Initial concentration $1\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in r_2167 and as a modifier in r_2167), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1806} = 0 \tag{1222}$$

7.422 Species s_1807

Name (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran

SBO:0000247 simple chemical

Initial concentration $0\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in r_2533), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1807} = 0 \tag{1223}$$

7.423 Species s_1835

Name 5'-deoxyribose

SBO:0000247 simple chemical

Initial concentration $0\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in r_2534), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_1835} = 0 \tag{1224}$$

7.424 Species s_2072

Name p-Cresol

SBO:0000247 simple chemical

Initial concentration $0\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in r_2537), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_2072} = 0 \tag{1225}$$

7.425 Species s_2093

Name S-Adenosyl-4-methylthio-2-oxobutanoate

SBO:0000247 simple chemical

Initial concentration $0\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in r_2538), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s\_2093} = 0 \tag{1226}$$

7.426 Species e_0001

Name thrA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0369, r_0769), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0001} = 0 \tag{1227}$$

7.427 Species e_0002

Name thrB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0770), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0002} = 0 \tag{1228}$$

7.428 Species e_0003

Name thrC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1349), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0003} = 0 \tag{1229}$$

7.429 Species e_0005

Name talB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1356), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0005} = 0 \tag{1230}$$

7.430 Species e_0006

Name mog

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0965), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0006} = 0 \tag{1231}$$

7.431 Species e_0008

Name ribF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0611, r_1264), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0008} = 0 \tag{1232}$$

7.432 Species e_0010

Name ispH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0014, r_0015), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0010} = 0 \tag{1233}$$

7.433 Species e_0012

Name dapB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0502), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0012} = 0 \tag{1234}$$

7.434 Species e_0020

Name folA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0504), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0020} = 0 \tag{1235}$$

7.435 Species e_0022

Name pdxA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1245), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0022} = 0 \tag{1236}$$

7.436 Species e_0030

Name leuD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0066, r_0138), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0030} = 0 \tag{1237}$$

7.437 Species e_0031

Name leuC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0066, r_0138), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0031} = 0 \tag{1238}$$

7.438 Species e_0032

Name leuB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0139), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0032} = 0 \tag{1239}$$

7.439 Species e_0033

Name leuA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0067), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0033} = 0 \tag{1240}$$

7.440 Species e_0034

Name ilvI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0038, r_0227), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0034} = 0 \tag{1241}$$

7.441 Species e_0035

Name ilvH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0038, r_0227), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0035} = 0 \tag{1242}$$

7.442 Species e_0036

Name ftsI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0970), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0036} = 0 \tag{1243}$$

7.443 Species e_0037

Name murE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1400), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0037} = 0 \tag{1244}$$

7.444 Species e_0038

Name murF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1401), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0038} = 0 \tag{1245}$$

7.445 Species e_0039

Name mraY

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1137), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0039} = 0 \tag{1246}$$

7.446 Species e_0040

Name murD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1399), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0040} = 0 \tag{1247}$$

7.447 Species e_0041

Name murG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1393), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0041} = 0 \tag{1248}$$

7.448 Species e_0042

Name murC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1397), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0042} = 0 \tag{1249}$$

7.449 Species e_0043

Name ddlB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0463), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0043} = 0 \tag{1250}$$

7.450 Species e_0044

Name lpxC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1379), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0044} = 0 \tag{1251}$$

7.451 Species e_0045

Name mutT

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0510), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0045} = 0 \tag{1252}$$

7.452 Species e_0046

Name coaE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0488), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0046} = 0 \tag{1253}$$

7.453 Species e_0048

Name nadC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1021), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0048} = 0 \tag{1254}$$

7.454 Species e_0051

Name aceE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1251), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0051} = 0 \tag{1255}$$

7.455 Species e_0052

Name aceF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1251), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0052} = 0 \tag{1256}$$

7.456 Species e_0053

Name lpdA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1251), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0053} = 0 \tag{1257}$$

7.457 Species e_0054

Name acnB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0246, r_0247), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0054} = 0 \tag{1258}$$

7.458 Species e_0060

Name can

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0755), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0060} = 0 \tag{1259}$$

7.459 Species e_0061

Name panD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0367), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0061} = 0 \tag{1260}$$

7.460 Species e_0062

Name panC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1076), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0062} = 0 \tag{1261}$$

7.461 Species e_0063

Name panB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0143), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0063} = 0 \tag{1262}$$

7.462 Species e_0064

Name folK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0216), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0064} = 0 \tag{1263}$$

7.463 Species e_0065

Name mrcB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0970), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0065} = 0 \tag{1264}$$

7.464 Species e_0071

Name hemL

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0678), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0071} = 0 \tag{1265}$$

7.465 Species e_0074

Name mtnN

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0186, r_1288), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0074} = 0 \tag{1266}$$

7.466 Species e_0076

Name dapD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1338), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0076} = 0 \tag{1267}$$

7.467 Species e_0077

Name pyrH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1409), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0077} = 0 \tag{1268}$$

7.468 Species e_0078

Name dxr

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0011), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0078} = 0 \tag{1269}$$

7.469 Species e_0079

Name uppS

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1410), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0079} = 0 \tag{1270}$$

7.470 Species e_0080

Name cdsA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0418, r_0419), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0080} = 0 \tag{1271}$$

7.471 Species e_0081

Name lpxD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1378), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0081} = 0 \tag{1272}$$

7.472 Species e_0082

Name fabZ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0145, r_0148), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0082} = 0 \tag{1273}$$

7.473 Species e_0083

Name lpxA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1391), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0083} = 0 \tag{1274}$$

7.474 Species e_0084

Name lpxB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0857), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0084} = 0 \tag{1275}$$

7.475 Species e_0085

Name accA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0237), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0085} = 0 \tag{1276}$$

7.476 Species e_0094

Name fadE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in seven reactions (as a modifier in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0094} = 0 \tag{1277}$$

7.477 Species e_0099

Name proB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0673), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0099} = 0 \tag{1278}$$

7.478 Species e_0100

Name proA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0679), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0100} = 0 \tag{1279}$$

7.479 Species e_0103

Name argF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1065), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0103} = 0 \tag{1280}$$

7.480 Species e_0110

Name yahI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0388), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0110} = 0 \tag{1281}$$

7.481 Species e_0116

Name cynT

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0755), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0116} = 0 \tag{1282}$$

7.482 Species e_0125

Name mhpF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0224), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0125} = 0 \tag{1283}$$

7.483 Species e_0134

Name hemB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1223), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0134} = 0 \tag{1284}$$

7.484 Species e_0135

Name ddlA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0463), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0135} = 0 \tag{1285}$$

7.485 Species e_0137

Name proC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1250), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0137} = 0 \tag{1286}$$

7.486 Species e_0138

Name aroL

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1305), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0138} = 0 \tag{1287}$$

7.487 Species e_0139

Name mak

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0761), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0139} = 0 \tag{1288}$$

7.488 Species e_0144

Name ribD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0212, r_0498), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0144} = 0 \tag{1289}$$

7.489 Species e_0145

Name ribH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1266), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0145} = 0 \tag{1290}$$

7.490 Species e_0146

Name thiL

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1345), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0146} = 0 \tag{1291}$$

7.491 Species e_0149

Name dxs

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0009), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0149} = 0 \tag{1292}$$

7.492 Species e_0150

Name ispA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0522, r_0655), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0150} = 0 \tag{1293}$$

7.493 Species e_0151

Name thiI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1346), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0151} = 0 \tag{1294}$$

7.494 Species e_0152

Name panE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0063), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0152} = 0 \tag{1295}$$

7.495 Species e_0162

Name tesB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in three reactions (as a modifier in r_0579, r_0580, r_0581), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0162} = 0 \tag{1296}$$

7.496 Species e_0167

Name adk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in six reactions (as a modifier in r_0292, r_0301, r_1039, r_1043, r_1045, r_1046), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0167} = 0 \tag{1297}$$

7.497 Species e_0168

Name hemH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0602), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0168} = 0 \tag{1298}$$

7.498 Species e_0175

Name gcl

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0739), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0175} = 0 \tag{1299}$$

7.499 Species e_0177

Name glxR

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1335), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0177} = 0 \tag{1300}$$

7.500 Species e_0183

Name arcC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0388), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0183} = 0 \tag{1301}$$

7.501 Species e_0184

Name purK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1206), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0184} = 0 \tag{1302}$$

7.502 Species e_0185

Name purE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1207), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0185} = 0 \tag{1303}$$

7.503 Species e_0186

Name lpxH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1402), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0186} = 0 \tag{1304}$$

7.504 Species e_0188

Name folD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0950, r_0957), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0188} = 0 \tag{1305}$$

7.505 Species e_0221

Name mrdA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0970), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0221} = 0 \tag{1306}$$

7.506 Species e_0223

Name nadD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1019), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0223} = 0 \tag{1307}$$

7.507 Species e_0225

Name hscC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1047), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0225} = 0 \tag{1308}$$

7.508 Species e_0238

Name fldA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a modifier in r_0084, r_1255, r_1276, r_1277, r_1278, r_1279), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0238} = 0 \tag{1309}$$

7.509 Species e_0246

Name gltA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0428), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0246} = 0 \tag{1310}$$

7.510 Species e_0253

Name sucC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1315), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0253} = 0 \tag{1311}$$

7.511 Species e_0254

Name sucD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1315), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0254} = 0 \tag{1312}$$

7.512 Species e_0260

Name nadA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1259), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0260} = 0 \tag{1313}$$

7.513 Species e_0263

Name aroG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0101), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0263} = 0 \tag{1314}$$

7.514 Species e_0264

Name gpmA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1153), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0264} = 0 \tag{1315}$$

7.515 Species e_0273

Name pgl

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0218), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0273} = 0 \tag{1316}$$

7.516 Species e_0274

Name bioA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0297), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0274} = 0 \tag{1317}$$

7.517 Species e_0275

Name bioB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0383), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0275} = 0 \tag{1318}$$

7.518 Species e_0276

Name bioF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0222), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0276} = 0 \tag{1319}$$

7.519 Species e_0277

Name bioC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0934), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0277} = 0 \tag{1320}$$

7.520 Species e_0278

Name bioD1

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0489), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0278} = 0 \tag{1321}$$

7.521 Species e_0279

Name moaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0445), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0279} = 0 \tag{1322}$$

7.522 Species e_0280

Name moaC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0445), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0280} = 0 \tag{1323}$$

7.523 Species e_0281

Name moaD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0963, r_0968), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0281} = 0 \tag{1324}$$

7.524 Species e_0282

Name moaE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0968), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0282} = 0 \tag{1325}$$

7.525 Species e_0291

Name moeB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0969), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0291} = 0 \tag{1326}$$

7.526 Species e_0292

Name moeA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0384, r_0964), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0292} = 0 \tag{1327}$$

7.527 Species e_0300

Name ybjG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1413), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0300} = 0 \tag{1328}$$

7.528 Species e_0313

Name ltaE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1348), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0313} = 0 \tag{1329}$$

7.529 Species e_0318

Name trxB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1347), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0318} = 0 \tag{1330}$$

7.530 Species e_0323

Name pflA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1252), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0323} = 0 \tag{1331}$$

7.531 Species e_0324

Name pflB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1252), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0324} = 0 \tag{1332}$$

7.532 Species e_0326

Name serC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1054, r_1217), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0326} = 0 \tag{1333}$$

7.533 Species e_0327

Name aroA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0175), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0327} = 0 \tag{1334}$$

7.534 Species e_0328

Name cmk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0457, r_1409), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0328} = 0 \tag{1335}$$

7.535 Species e_0330

Name lpxK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1337), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0330} = 0 \tag{1336}$$

7.536 Species e_0331

Name kdsB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0105), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0331} = 0 \tag{1337}$$

7.537 Species e_0332

Name aspC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in three reactions (as a modifier in r_0370, r_1081, r_1376), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0332} = 0 \tag{1338}$$

7.538 Species e_0342

Name pyrD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0501, r_0512), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0342} = 0 \tag{1339}$$

7.539 Species e_0368

Name pyrC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0511), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0368} = 0 \tag{1340}$$

7.540 Species e_0372

Name fabH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0147), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0372} = 0 \tag{1341}$$

7.541 Species e_0373

Name fabD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0935), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0373} = 0 \tag{1342}$$

7.542 Species e_0374

Name fabG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in three reactions (as a modifier in r_0146, r_0149, r_0154), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0374} = 0 \tag{1343}$$

7.543 Species e_0375

Name acpP

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in seven reactions (as a modifier in r_0257, r_0259, r_0260, r_0706, r_0707, r_0935, r_1391), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0375} = 0 \tag{1344}$$

7.544 Species e_0376

Name fabF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0166), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0376} = 0 \tag{1345}$$

7.545 Species e_0377

Name pabC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0182), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0377} = 0 \tag{1346}$$

7.546 Species e_0378

Name tmk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0532), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0378} = 0 \tag{1347}$$

7.547 Species e_0389

Name purB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0302, r_0304), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0389} = 0 \tag{1348}$$

7.548 Species e_0391

Name icd

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0806), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0391} = 0 \tag{1349}$$

7.549 Species e_0395

Name dadX

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0310), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0395} = 0 \tag{1350}$$

7.550 Species e_0403

Name prs

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1215), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0403} = 0 \tag{1351}$$

7.551 Species e_0404

Name ispE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0178), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0404} = 0 \tag{1352}$$

7.552 Species e_0405

Name hemA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0686), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0405} = 0 \tag{1353}$$

7.553 Species e_0406

Name kdsA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0100), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0406} = 0 \tag{1354}$$

7.554 Species e_0416

Name adhE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0224), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0416} = 0 \tag{1355}$$

7.555 Species e_0425

Name trpA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1367), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0425} = 0 \tag{1356}$$

7.556 Species e_0426

Name trpB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1367), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0426} = 0 \tag{1357}$$

7.557 Species e_0427

Name trpC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0788, r_1211), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0427} = 0 \tag{1358}$$

7.558 Species e_0428

Name trpD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0348, r_0349), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0428} = 0 \tag{1359}$$

7.559 Species e_0429

Name trpE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0349), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0429} = 0 \tag{1360}$$

7.560 Species e_0431

Name acnA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0246, r_0247), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0431} = 0 \tag{1361}$$

7.561 Species e_0432

Name ribA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0745), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0432} = 0 \tag{1362}$$

7.562 Species e_0433

Name pgpB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1413), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0433} = 0 \tag{1363}$$

7.563 Species e_0435

Name pyrF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1068), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0435} = 0 \tag{1364}$$

7.564 Species e_0436

Name fabI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0563, r_0564), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0436} = 0 \tag{1365}$$

7.565 Species e_0439

Name puuA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0683), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0439} = 0 \tag{1366}$$

7.566 Species e_0451

Name ydbK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1255), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0451} = 0 \tag{1367}$$

7.567 Species e_0466

Name aldA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0731), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0466} = 0 \tag{1368}$$

7.568 Species e_0514

Name folM

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0504), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0514} = 0 \tag{1369}$$

7.569 Species e_0515

Name fumC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0632), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0515} = 0 \tag{1370}$$

7.570 Species e_0516

Name fumA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0632), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0516} = 0 \tag{1371}$$

7.571 Species e_0519

Name malY

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0450), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0519} = 0 \tag{1372}$$

7.572 Species e_0531

Name ribE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1265), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0531} = 0 \tag{1373}$$

7.573 Species e_0540

Name ydiB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1304), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0540} = 0 \tag{1374}$$

7.574 Species e_0541

Name aroD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0098), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0541} = 0 \tag{1375}$$

7.575 Species e_0544

Name aroH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0101), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0544} = 0 \tag{1376}$$

7.576 Species e_0554

Name nadE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1008), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0554} = 0 \tag{1377}$$

7.577 Species e_0559

Name astC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0245), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0559} = 0 \tag{1378}$$

7.578 Species e_0561

Name gdhA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0675), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0561} = 0 \tag{1379}$$

7.579 Species e_0567

Name gapA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0574, r_0695), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0567} = 0 \tag{1380}$$

7.580 Species e_0572

Name pabB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0181), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0572} = 0 \tag{1381}$$

7.581 Species e_0577

Name purT

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0225, r_0648), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0577} = 0 \tag{1382}$$

7.582 Species e_0578

Name eda

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0056), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0578} = 0 \tag{1383}$$

7.583 Species e_0579

Name edd

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0217), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0579} = 0 \tag{1384}$$

7.584 Species e_0580

Name zwf

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0660), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0580} = 0 \tag{1385}$$

7.585 Species e_0586

Name nudB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0510), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0586} = 0 \tag{1386}$$

7.586 Species e_0605

Name hisG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0374), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0605} = 0 \tag{1387}$$

7.587 Species e_0606

Name hisD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0763), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0606} = 0 \tag{1388}$$

7.588 Species e_0607

Name hisC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0765), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0607} = 0 \tag{1389}$$

7.589 Species e_0608

Name hisB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0764, r_0785), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0608} = 0 \tag{1390}$$

7.590 Species e_0609

Name hisH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0784), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0609} = 0 \tag{1391}$$

7.591 Species e_0610

Name hisA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0008), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0610} = 0 \tag{1392}$$

7.592 Species e_0611

Name hisF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0784), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0611} = 0 \tag{1393}$$

7.593 Species e_0612

Name hisI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1204, r_1205), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0612} = 0 \tag{1394}$$

7.594 Species e_0641

Name thiD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1198), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0641} = 0 \tag{1395}$$

7.595 Species e_0657

Name folE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0744), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0657} = 0 \tag{1396}$$

7.596 Species e_0682

Name atoB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0230), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0682} = 0 \tag{1397}$$

7.597 Species e_0691

Name nudI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0533), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0691} = 0 \tag{1398}$$

7.598 Species e_0717

Name yfbQ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0815), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0717} = 0 \tag{1399}$$

7.599 Species e_0719

Name ackA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0225), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0719} = 0 \tag{1400}$$

7.600 Species e_0720

Name pta

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1218), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0720} = 0 \tag{1401}$$

7.601 Species e_0727

Name ubiX

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1064), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0727} = 0 \tag{1402}$$

7.602 Species e_0728

Name purF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0682), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0728} = 0 \tag{1403}$$

7.603 Species e_0729

Name folC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0505), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0729} = 0 \tag{1404}$$

7.604 Species e_0730

Name accD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0237), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0730} = 0 \tag{1405}$$

7.605 Species e_0731

Name pdxB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0573), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0731} = 0 \tag{1406}$$

7.606 Species e_0732

Name fabB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0150, r_0166), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0732} = 0 \tag{1407}$$

7.607 Species e_0734

Name aroC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0425), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0734} = 0 \tag{1408}$$

7.608 Species e_0735

Name fadJ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in 14 reactions (as a modifier in r_0120, r_0121, r_0122, r_0123, r_0124, r_0126, r_0127, r_0128, r_0129, r_0130, r_0131, r_0133, r_0134, r_0135), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0735} = 0 \tag{1409}$$

7.609 Species e_0736

Name fadI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in seven reactions (as a modifier in r_0230, r_0231, r_0232, r_0233, r_0234, r_0235, r_0236), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0736} = 0 \tag{1410}$$

7.610 Species e_0742

Name yfdZ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0815), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0742} = 0 \tag{1411}$$

7.611 Species e_0743

Name glk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0762), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0743} = 0 \tag{1412}$$

7.612 Species e_0746

Name gltX

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0687), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0746} = 0 \tag{1413}$$

7.613 Species e_0750

Name cysK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0452), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0750} = 0 \tag{1414}$$

7.614 Species e_0757

Name cysM

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0452), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0757} = 0 \tag{1415}$$

7.615 Species e_0765

Name hemF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0436), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0765} = 0 \tag{1416}$$

7.616 Species e_0768

Name eutD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1218), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0768} = 0 \tag{1417}$$

7.617 Species e_0770

Name talA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1356), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0770} = 0 \tag{1418}$$

7.618 Species e_0771

Name tktB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1357, r_1358), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0771} = 0 \tag{1419}$$

7.619 Species e_0774

Name dapE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1316), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0774} = 0 \tag{1420}$$

7.620 Species e_0775

Name purC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1210), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0775} = 0 \tag{1421}$$

7.621 Species e_0776

Name dapA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0503), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0776} = 0 \tag{1422}$$

7.622 Species e_0791

Name purM

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1208), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0791} = 0 \tag{1423}$$

7.623 Species e_0793

Name ppk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1222), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0793} = 0 \tag{1424}$$

7.624 Species e_0795

Name guaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0741), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0795} = 0 \tag{1425}$$

7.625 Species e_0796

Name guaB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0787), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0796} = 0 \tag{1426}$$

7.626 Species e_0798

Name ispG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0084), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0798} = 0 \tag{1427}$$

7.627 Species e_0799

Name ndk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a modifier in r_1039, r_1043, r_1045, r_1046), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0799} = 0 \tag{1428}$$

7.628 Species e_0803

Name iscA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0799, r_0801), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0803} = 0 \tag{1429}$$

7.629 Species e_0804

Name nifU

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a modifier in r_0796, r_0797, r_0798, r_0799, r_0800, r_0801), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0804} = 0 \tag{1430}$$

7.630 Species e_0805

Name iscS

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a modifier in r_0796, r_0797, r_0798, r_0802, r_0963, r_1346), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0805} = 0 \tag{1431}$$

7.631 Species e_0813

Name glyA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0726, r_1348), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0813} = 0 \tag{1432}$$

7.632 Species e_0815

Name purL

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1212), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0815} = 0 \tag{1433}$$

7.633 Species e_0818

Name pdxJ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1245), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0818} = 0 \tag{1434}$$

7.634 Species e_0819

Name nadB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0829), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0819} = 0 \tag{1435}$$

7.635 Species e_0821

Name grcA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1252), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0821} = 0 \tag{1436}$$

7.636 Species e_0822

Name trxC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1139, r_1347), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0822} = 0 \tag{1437}$$

7.637 Species e_0823

Name pssA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1130, r_1131), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0823} = 0 \tag{1438}$$

7.638 Species e_0825

Name pheA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0423, r_1224), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0825} = 0 \tag{1439}$$

7.639 Species e_0826

Name tyrA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0423, r_1225), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0826} = 0 \tag{1440}$$

7.640 Species e_0827

Name aroF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0101), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0827} = 0 \tag{1441}$$

7.641 Species e_0828

Name ppnK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1006), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0828} = 0 \tag{1442}$$

7.642 Species e_0839

Name luxS

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1291), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0839} = 0 \tag{1443}$$

7.643 Species e_0848

Name gutQ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0355), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0848} = 0 \tag{1444}$$

7.644 Species e_0866

Name ispF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0053), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0866} = 0 \tag{1445}$$

7.645 Species e_0867

Name ispD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0054), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0867} = 0 \tag{1446}$$

7.646 Species e_0868

Name cysC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0305), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0868} = 0 \tag{1447}$$

7.647 Species e_0869

Name cysN

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1329), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0869} = 0 \tag{1448}$$

7.648 Species e_0870

Name cysD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1329), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0870} = 0 \tag{1449}$$

7.649 Species e_0871

Name cysH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1139), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0871} = 0 \tag{1450}$$

7.650 Species e_0872

Name cysI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1330), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0872} = 0 \tag{1451}$$

7.651 Species e_0873

Name cysJ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1330), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0873} = 0 \tag{1452}$$

7.652 Species e_0875

Name eno

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0538), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0875} = 0 \tag{1453}$$

7.653 Species e_0876

Name pyrG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0440), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0876} = 0 \tag{1454}$$

7.654 Species e_0893

Name argA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0999), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0893} = 0 \tag{1455}$$

7.655 Species e_0894

Name thyA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1353), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0894} = 0 \tag{1456}$$

7.656 Species e_0896

Name aas

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in three reactions (as a modifier in r_0257, r_0259, r_0260), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0896} = 0 \tag{1457}$$

7.657 Species e_0897

Name lysA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0499), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0897} = 0 \tag{1458}$$

7.658 Species e_0903

Name yqeA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0388), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0903} = 0 \tag{1459}$$

7.659 Species e_0911

Name fldB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in six reactions (as a modifier in r_0084, r_1255, r_1276, r_1277, r_1278, r_1279), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0911} = 0 \tag{1460}$$

7.660 Species e_0918

Name serA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1151), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0918} = 0 \tag{1461}$$

7.661 Species e_0919

Name rpiA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1284), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0919} = 0 \tag{1462}$$

7.662 Species e_0925

Name pgk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1152), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0925} = 0 \tag{1463}$$

7.663 Species e_0926

Name epd

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0574), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0926} = 0 \tag{1464}$$

7.664 Species e_0928

Name tktA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1357, r_1358), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0928} = 0 \tag{1465}$$

7.665 Species e_0931

Name metK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0951), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0931} = 0 \tag{1466}$$

7.666 Species e_0941

Name glcD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0734, r_0735), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0941} = 0 \tag{1467}$$

7.667 Species e_0951

Name metC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0450), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0951} = 0 \tag{1468}$$

7.668 Species e_0953

Name plsC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0012, r_0013), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0953} = 0 \tag{1469}$$

7.669 Species e_0960

Name ribB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0092), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0960} = 0 \tag{1470}$$

7.670 Species e_0962

Name uppP

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1413), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0962} = 0 \tag{1471}$$

7.671 Species e_0964

Name folB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0507), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0964} = 0 \tag{1472}$$

7.672 Species e_0974

Name tdcE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1252), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0974} = 0 \tag{1473}$$

7.673 Species e_0975

Name tdcD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0225), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0975} = 0 \tag{1474}$$

7.674 Species e_0977

Name tdcB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0847), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0977} = 0 \tag{1475}$$

7.675 Species e_0978

Name garK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0697), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0978} = 0 \tag{1476}$$

7.676 Species e_0979

Name garR

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1335), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0979} = 0 \tag{1477}$$

7.677 Species e_0986

Name argG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0361), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0986} = 0 \tag{1478}$$

7.678 Species e_0987

Name glmM

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1150), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0987} = 0 \tag{1479}$$

7.679 Species e_0988

Name folP

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0515), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0988} = 0 \tag{1480}$$

7.680 Species e_0990

Name ispB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1063), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0990} = 0 \tag{1481}$$

7.681 Species e_0991

Name murA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1389), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0991} = 0 \tag{1482}$$

7.682 Species e_0993

Name kdsD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0355), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0993} = 0 \tag{1483}$$

7.683 Species e_0994

Name kdsC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0106), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_0994} = 0 \tag{1484}$$

7.684 Species e_1004

Name mdh

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0925), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1004} = 0 \tag{1485}$$

7.685 Species e_1005

Name accB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0237), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1005} = 0 \tag{1486}$$

7.686 Species e_1006

Name accC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0237), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1006} = 0 \tag{1487}$$

7.687 Species e_1010

Name aroE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1304), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1010} = 0 \tag{1488}$$

7.688 Species e_1014

Name argD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0245, r_1318), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1014} = 0 \tag{1489}$$

7.689 Species e_1015

Name pabA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0181), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1015} = 0 \tag{1490}$$

7.690 Species e_1019

Name cysG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in three reactions (as a modifier in r_1306, r_1307, r_1422), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1019} = 0 \tag{1491}$$

7.691 Species e_1023

Name yhfW

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1202), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1023} = 0 \tag{1492}$$

7.692 Species e_1026

Name rpe

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1285), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1026} = 0 \tag{1493}$$

7.693 Species e_1027

Name aroB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0099), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1027} = 0 \tag{1494}$$

7.694 Species e_1028

Name aroK

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1305), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1028} = 0 \tag{1495}$$

7.695 Species e_1029

Name mrcA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0970), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1029} = 0 \tag{1496}$$

7.696 Species e_1034

Name bioH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1220), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1034} = 0 \tag{1497}$$

7.697 Species e_1045

Name asd

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0371), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1045} = 0 \tag{1498}$$

7.698 Species e_1086

Name xylA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1432), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1086} = 0 \tag{1499}$$

7.699 Species e_1105

Name cysE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1301), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1105} = 0 \tag{1500}$$

7.700 Species e_1106

Name gpsA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0712), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1106} = 0 \tag{1501}$$

7.701 Species e_1108

Name gpmI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1153), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1108} = 0 \tag{1502}$$

7.702 Species e_1109

Name tdh

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0848), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1109} = 0 \tag{1503}$$

7.703 Species e_1110

Name kbl

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0724), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1110} = 0 \tag{1504}$$

7.704 Species e_1125

Name waaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0102, r_0103), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1125} = 0 \tag{1505}$$

7.705 Species e_1126

Name coaD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1074), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1126} = 0 \tag{1506}$$

7.706 Species e_1127

Name coaBC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1200, r_1201), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1127} = 0 \tag{1507}$$

7.707 Species e_1128

Name dut

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0533), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1128} = 0 \tag{1508}$$

7.708 Species e_1129

Name pyrE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1067), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1129} = 0 \tag{1509}$$

7.709 Species e_1130

Name gmk

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0754), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1130} = 0 \tag{1510}$$

7.710 Species e_1136

Name ilvN

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0038, r_0227), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1136} = 0 \tag{1511}$$

7.711 Species e_1137

Name ilvB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0038, r_0227), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1137} = 0 \tag{1512}$$

7.712 Species e_1141

Name tnaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1368), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1141} = 0 \tag{1513}$$

7.713 Species e_1149

Name glmS

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0684), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1149} = 0 \tag{1514}$$

7.714 Species e_1150

Name glmU

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0658, r_1392), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1150} = 0 \tag{1515}$$

7.715 Species e_1160

Name asnA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0365), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1160} = 0 \tag{1516}$$

7.716 Species e_1167

Name ilvE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a modifier in r_0808, r_0854, r_1081, r_1425), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1167} = 0 \tag{1517}$$

7.717 Species e_1168

Name ilvD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0517, r_0518), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1168} = 0 \tag{1518}$$

7.718 Species e_1169

Name ilvA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0847), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1169} = 0 \tag{1519}$$

7.719 Species e_1170

Name ilvC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in three reactions (as a modifier in r_0063, r_0811, r_0812), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1170} = 0 \tag{1520}$$

7.720 Species e_1172

Name trxA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1139, r_1347), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1172} = 0 \tag{1521}$$

7.721 Species e_1184

Name hemX

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1422), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1184} = 0 \tag{1522}$$

7.722 Species e_1185

Name hemD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1423), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1185} = 0 \tag{1523}$$

7.723 Species e_1186

Name hemC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0777), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1186} = 0 \tag{1524}$$

7.724 Species e_1188

Name cyaY

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0797, r_0798), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1188} = 0 \tag{1525}$$

7.725 Species e_1189

Name dapF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0500), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1189} = 0 \tag{1526}$$

7.726 Species e_1196

Name metE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0954), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1196} = 0 \tag{1527}$$

7.727 Species e_1200

Name ubiD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1064), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1200} = 0 \tag{1528}$$

7.728 Species e_1201

Name fre

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0576), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1201} = 0 \tag{1529}$$

7.729 Species e_1202

Name fadA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in seven reactions (as a modifier in r_0230, r_0231, r_0232, r_0233, r_0234, r_0235, r_0236), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1202} = 0 \tag{1530}$$

7.730 Species e_1203

Name fadB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in 15 reactions (as a modifier in r_0096, r_0120, r_0121, r_0122, r_0123, r_0124, r_0126, r_0127, r_0128, r_0129, r_0130, r_0131, r_0133, r_0134, r_0135), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1203} = 0 \tag{1531}$$

7.731 Species e_1205

Name hemG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1230), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1205} = 0 \tag{1532}$$

7.732 Species e_1206

Name mobB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0385, r_0386), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1206} = 0 \tag{1533}$$

7.733 Species e_1207

Name mobA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0385, r_0386), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1207} = 0 \tag{1534}$$

7.734 Species e_1210

Name glnA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0683), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1210} = 0 \tag{1535}$$

7.735 Species e_1226

Name tpiA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1363), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1226} = 0 \tag{1536}$$

7.736 Species e_1227

Name fpr

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a modifier in r_1276, r_1277, r_1278, r_1279), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1227} = 0 \tag{1537}$$

7.737 Species e_1232

Name metB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1057), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1232} = 0 \tag{1538}$$

7.738 Species e_1233

Name metL

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0369, r_0769), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1233} = 0 \tag{1539}$$

7.739 Species e_1234

Name metF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0211), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1234} = 0 \tag{1540}$$

7.740 Species e_1238

Name pflD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1252), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1238} = 0 \tag{1541}$$

7.741 Species e_1239

Name pflC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1252), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1239} = 0 \tag{1542}$$

7.742 Species e_1240

Name ppc

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1141), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1240} = 0 \tag{1543}$$

7.743 Species e_1241

Name argE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0244), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1241} = 0 \tag{1544}$$

7.744 Species e_1242

Name argC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0996), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1242} = 0 \tag{1545}$$

7.745 Species e_1243

Name argB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0243), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1243} = 0 \tag{1546}$$

7.746 Species e_1244

Name argH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0360), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1244} = 0 \tag{1547}$$

7.747 Species e_1247

Name murI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0676), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1247} = 0 \tag{1548}$$

7.748 Species e_1248

Name murB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1388), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1248} = 0 \tag{1549}$$

7.749 Species e_1249

Name coaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1075), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1249} = 0 \tag{1550}$$

7.750 Species e_1250

Name thiH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1346), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1250} = 0 \tag{1551}$$

7.751 Species e_1251

Name thiG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1375), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1251} = 0 \tag{1552}$$

7.752 Species e_1252

Name thiF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1346), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1252} = 0 \tag{1553}$$

7.753 Species e_1253

Name thiE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1344), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1253} = 0 \tag{1554}$$

7.754 Species e_1254

Name thiC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0179), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1254} = 0 \tag{1555}$$

7.755 Species e_1256

Name hemE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1421), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1256} = 0 \tag{1556}$$

7.756 Species e_1257

Name purD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1214), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1257} = 0 \tag{1557}$$

7.757 Species e_1258

Name purH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0786, r_1209), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1258} = 0 \tag{1558}$$

7.758 Species e_1259

Name metA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0771), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1259} = 0 \tag{1559}$$

7.759 Species e_1262

Name metH

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0954), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1262} = 0 \tag{1560}$$

7.760 Species e_1263

Name lysC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0369), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1263} = 0 \tag{1561}$$

7.761 Species e_1264

Name pgi

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0664), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1264} = 0 \tag{1562}$$

7.762 Species e_1271

Name ubiC

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0424), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1271} = 0 \tag{1563}$$

7.763 Species e_1272

Name ubiA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0775), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1272} = 0 \tag{1564}$$

7.764 Species e_1273

Name plsB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0706, r_0707), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1273} = 0 \tag{1565}$$

7.765 Species e_1275

Name alr

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0310), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1275} = 0 \tag{1566}$$

7.766 Species e_1276

Name tyrB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in three reactions (as a modifier in r_0854, r_1081, r_1376), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1276} = 0 \tag{1567}$$

7.767 Species e_1277

Name aphA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1134), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1277} = 0 \tag{1568}$$

7.768 Species e_1291

Name rpiB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1284), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1291} = 0 \tag{1569}$$

7.769 Species e_1298

Name fumB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0632), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1298} = 0 \tag{1570}$$

7.770 Species e_1312

Name psd

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_1123, r_1124), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1312} = 0 \tag{1571}$$

7.771 Species e_1313

Name rsgA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1047), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1313} = 0 \tag{1572}$$

7.772 Species e_1315

Name purA

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0303), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1315} = 0 \tag{1573}$$

7.773 Species e_1326

Name cysQ

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0085), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1326} = 0 \tag{1574}$$

7.774 Species e_1334

Name nrdG

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a modifier in r_1276, r_1277, r_1278, r_1279), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1334} = 0 \tag{1575}$$

7.775 Species e_1335

Name nrdD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a modifier in r_1276, r_1277, r_1278, r_1279), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1335} = 0 \tag{1576}$$

7.776 Species e_1339

Name pyrI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0368), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1339} = 0 \tag{1577}$$

7.777 Species e_1340

Name pyrB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_0368), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1340} = 0 \tag{1578}$$

7.778 Species e_1341

Name argI

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1065), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1341} = 0 \tag{1579}$$

7.779 Species e_1355

Name sgcE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1285), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1355} = 0 \tag{1580}$$

7.780 Species e_1366

Name deoB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1202), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1366} = 0 \tag{1581}$$

7.781 Species e_1367

Name deoD

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1232), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1367} = 0 \tag{1582}$$

7.782 Species e_1369

Name serB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1134), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1369} = 0 \tag{1583}$$

7.783 Species e_1373

Name gpmB

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1153), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1373} = 0 \tag{1584}$$

7.784 Species e_1374

Name thiS

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a modifier in r_1346), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1374} = 0 \tag{1585}$$

7.785 Species e_1376

Name glcF

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0734, r_0735), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1376} = 0 \tag{1586}$$

7.786 Species e_1377

Name glcE

SBO:0000252 polypeptide chain

Initial concentration $0.0010\ \mathrm{mmol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a modifier in r_0734, r_0735), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{e\_1377} = 0 \tag{1587}$$

A Glossary of Systems Biology Ontology Terms

SBO:0000176 biochemical reaction: An event involving one or more chemical entities that modifies the electrochemical structure of at least one of the participants.

SBO:0000185 transport reaction: Movement of a physical entity without modification of the structure of the entity

SBO:0000247 simple chemical: Simple, non-repetitive chemical entity

SBO:0000252 polypeptide chain: Naturally occurring macromolecule formed by the repetition of amino-acid residues linked by peptidic bonds. A polypeptide chain is synthesized by the ribosome. CHEBI:1654

SBO:0000281 equilibrium constant: Quantity characterizing a chemical equilibrium in a chemical reaction, which is a useful tool to determine the concentration of various reactants or products in a system where chemical equilibrium occurs

SBO:0000290 physical compartment: Specific location of space, that can be bounded or not. A physical compartment can have 1, 2 or 3 dimensions

SBO:0000322 Michaelis constant for substrate: Substrate concentration at which the velocity of product production by the forward activity of a reversible enzyme is half its maximum.

SBO:0000323 Michaelis constant for product: Product concentration at which the velocity of substrate production by the reverse activity of a reversible enzyme is half its maximum.

SBO:0000324 forward maximal velocity: Limiting maximal velocity of the forward reaction of a reversible enzyme, reached when the substrate is in large excess and all the enzyme is complexed.

SBO:0000460 enzymatic catalyst: A substance that accelerates the velocity of a chemical reaction without itself being consumed or transformed, by lowering the free energy of the transition state. The substance acting as a catalyst is an enzyme

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