SBML Model Report

Model name: "Beltrami1995_ThrombinGeneration_C"

May 6, 2016

1 General Overview

This is a document in SBML Level 2 Version 4 format. This model was created by Michael Schubert[1] at June 14th 2011 at 10:56 a. m. and last time modified at October nineth 2014 at 5:25 p. m. Table 1 shows 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	1
species types	0	species	8
events	0	constraints	0
reactions	0	function definitions	0
global parameters	10	unit definitions	0
rules	8	initial assignments	1

Model Notes

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To cite BioModels Database, please use: Li C, Donizelli M, Rodriguez N, Dharuri H, Endler L, Chelliah V, Li L, He E, Henry A, Stefan MI, Snoep JL, Hucka M, Le Novre N, Laibe C (2010)

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BioModels Database: An enhanced, curated and annotated resource for published quantitative kinetic models. BMC Syst Biol., 4:92.

2 Unit Definitions

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

2.1 Unit `substance`

Notes Mole is the predefined SBML unit for `substance`.

Definition mol

2.2 Unit `volume`

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

Definition l

2.3 Unit `area`

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

Definition m^2

2.4 Unit `length`

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

Definition m

2.5 Unit `time`

Notes Second is the predefined SBML unit for `time`.

Definition s

3 Compartment

This model contains one compartment.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
compartment_1			3	1	litre	☑	

3.1 Compartment compartment_1

This is a three dimensional compartment with a constant size given in litre.

4 Species

This model contains eight species. Section 8 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
Z1	Z1	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟
Z2	Z2	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟
Z3	Z3	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟
Z4	Z4	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟
E1	E1	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟
E2	E2	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟
E3	E3	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟
E4	E4	compartment_1	$\mathrm{mol} \cdot \mathrm{l}^{-1}$	⊟	⊟

5 Parameters

This model contains ten global parameters.

Table 4: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mu1	mu1		1.0		☑
mu2	mu2		0.1		☑
mu23	mu23		0.1		☑
mu3	mu3		0.1		☑
mu4	mu4		0.1		☑
k1	k1		1.0		☑
k2	k2		1.0		☑
k3	k3		5.0		☑
k4	k4		5.0		☑
mu5	mu5		1.0		☑

6 Initialassignment

This is an overview of one initialassignment.

6.1 Initialassignment E1

Derived unit contains undeclared units

Math $\frac{0.0010 \cdot [\mathrm{Z1}]}{0.999}$

7 Rules

This is an overview of eight rules.

7.1 Rule Z1

Rule Z1 is a rate rule for species Z1:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Z1} = (\mathrm{mu1} \cdot [\mathrm{E2}] + \mathrm{mu5} \cdot [\mathrm{E4}]) \cdot [\mathrm{Z1}] + \mathrm{k1} \cdot [\mathrm{E1}] \tag{1}$$

7.2 Rule Z2

Rule Z2 is a rate rule for species Z2:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Z2} = \mathrm{mu2} \cdot [\mathrm{E1}] \cdot [\mathrm{Z2}] + \mathrm{k2} \cdot [\mathrm{E2}] \tag{2}$$

7.3 Rule Z3

Rule Z3 is a rate rule for species Z3:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Z3} = (\mathrm{mu23} \cdot [\mathrm{E2}] + \mathrm{mu3} \cdot [\mathrm{E4}]) \cdot [\mathrm{Z3}] + \mathrm{k3} \cdot [\mathrm{E3}] \tag{3}$$

7.4 Rule Z4

Rule Z4 is a rate rule for species Z4:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Z4} = \mathrm{mu4} \cdot [\mathrm{E3}] \cdot [\mathrm{Z4}] + \mathrm{k4} \cdot [\mathrm{E4}] \tag{4}$$

7.5 Rule E1

Rule E1 is a rate rule for species E1:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{E1} = (\mathrm{mu1} \cdot [\mathrm{E2}] + \mathrm{mu5} \cdot [\mathrm{E4}]) \cdot [\mathrm{Z1}] - \mathrm{k1} \cdot [\mathrm{E1}] \tag{5}$$

7.6 Rule E2

Rule E2 is a rate rule for species E2:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{E2} = \mathrm{mu2} \cdot [\mathrm{E1}] \cdot [\mathrm{Z2}] - \mathrm{k2} \cdot [\mathrm{E2}] \tag{6}$$

7.7 Rule E3

Rule E3 is a rate rule for species E3:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{E3} = (\mathrm{mu23} \cdot [\mathrm{E2}] + \mathrm{mu3} \cdot [\mathrm{E4}]) \cdot [\mathrm{Z3}] - \mathrm{k3} \cdot [\mathrm{E3}] \tag{7}$$

7.8 Rule E4

Rule E4 is a rate rule for species E4:

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{E4} = \mathrm{mu4} \cdot [\mathrm{E3}] \cdot [\mathrm{Z4}] - \mathrm{k4} \cdot [\mathrm{E4}] \tag{8}$$

8 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.

8.1 Species Z1

Name Z1

Initial concentration $0.5\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Involved in rule Z1

One rule which determines this species' quantity.

8.2 Species Z2

Name Z2

Initial concentration $10\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Involved in rule Z2

One rule which determines this species' quantity.

8.3 Species Z3

Name Z3

Initial concentration $10\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Involved in rule Z3

One rule which determines this species' quantity.

8.4 Species Z4

Name Z4

Initial concentration $100\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Involved in rule Z4

One rule which determines this species' quantity.

8.5 Species E1

Name E1

Initial concentration $0\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Initial assignment E1

Involved in rule E1

One rule which determines this species' quantity.

8.6 Species E2

Name E2

Initial concentration $0\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Involved in rule E2

One rule which determines this species' quantity.

8.7 Species E3

Name E3

Initial concentration $0\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Involved in rule E3

One rule which determines this species' quantity.

8.8 Species E4

Name E4

Initial concentration $0\ \mathrm{mol} \cdot \mathrm{l}^{-1}$

Involved in rule E4

One rule which determines this species' quantity.

SBML2LaTeX was developed by Andreas Dräger[a], Hannes Planatscher[a], Dieudonné M Wouamba[a], Adrian Schröder[a], Michael Hucka[b], Lukas Endler[c], Martin Golebiewski[d] and Andreas Zell[a]. Please see http://www.ra.cs.uni-tuebingen.de/software/SBML2LaTeX for more information.

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