



**NanoCommons**

Nano-Knowledge Community

# **The European Nanotechnology Community Informatics Platform: Bridging data and disciplinary gaps for industry and regulators**

Martin Himly (University of Salzburg)

*12<sup>th</sup> NanoTrust Tagung*

*10<sup>th</sup> March 2020, Vienna*



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# Overview

- H2020 research infrastructure project
  - Call Topic: *INFRAIA-01-2018-2019: Integrating Activities for Advanced Communities*
- Beneficiaries:
  - 10 countries worldwide
  - 14 partners:
    - 12 EU countries (academia + SME)
    - 2 US partners (academia)

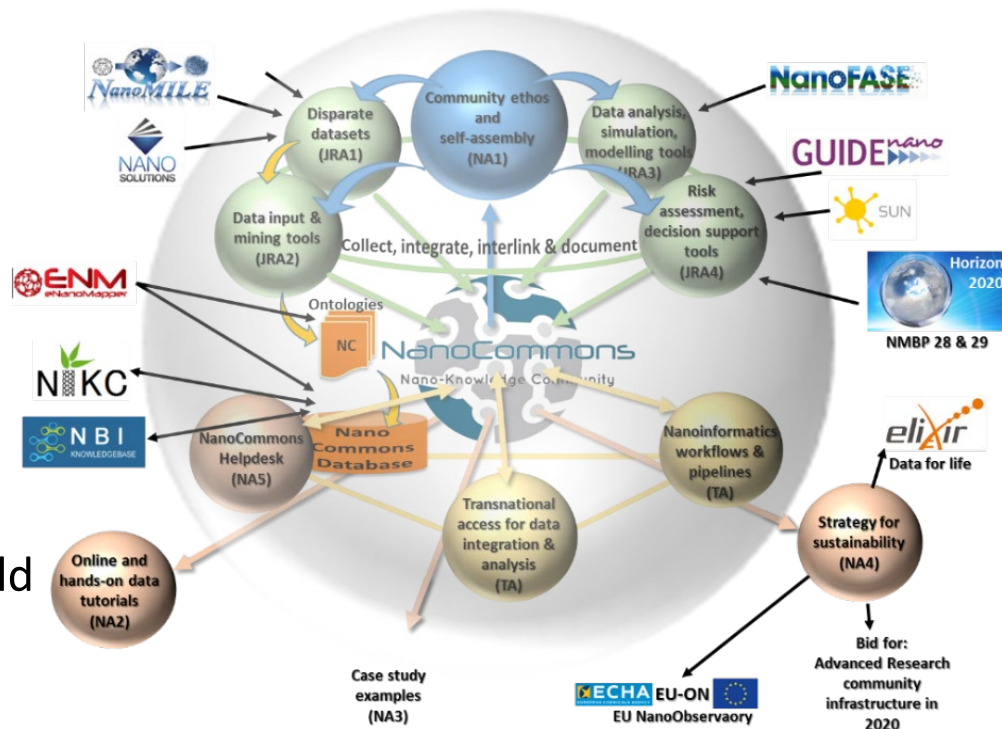


## The NanoCommons consortium



# The idea - problem & solution

- **Nanotechnologies** are a major area of investment & growth for the European economy
- Knowledge and **data** remain **fragmented** and inaccessible hampering progress
- **Read-across approaches** are **currently absent for NMs**, but would reduce the cost and time of nanosafety research and regulation



NanoCommons is creating an **e-infrastructure** for reproducible science, enhancing data integration & enabling nanoinformatics workflows to address these gaps

# The offer

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- NanoCommons **integrates the nanomaterials communities** around an agreed set of approaches for **data generation, data management and nanoinformatics** to support the risk and hazard assessment of NMs
- NanoCommons is **integrating and developing tools and services** for use by the nanomaterials communities



Experimental Workflows  
Design & Implementation



Data Processing  
& Analysis



Data Visualisation  
& Predictive Toxicity



Data Storage  
& Online Accessibility

- These tools and services can be **accessed** through the **NanoCommons Transnational Access scheme**
- NanoCommons provides **Trainings**, accessible through the **NanoCommons Infrastructure Platform**

# Data FAIRness

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- To remove **barriers** for nanosafety **regulatory and industry** processes
- To develop an **integrated knowledgebase** to facilitate development and application of regulatory tools such as **grouping & read-across**
- To create an **interconnected community** *via* a **FAIR data single market**
- To enable **full exploitation of EU-funded research data** & promotion of **data-driven innovation** leading to **positive socioeconomic impact**



# Data-driven Innovation



# Data Driven Innovation

Innovation

Intelligence

Wisdom

Information

Knowledge

Data

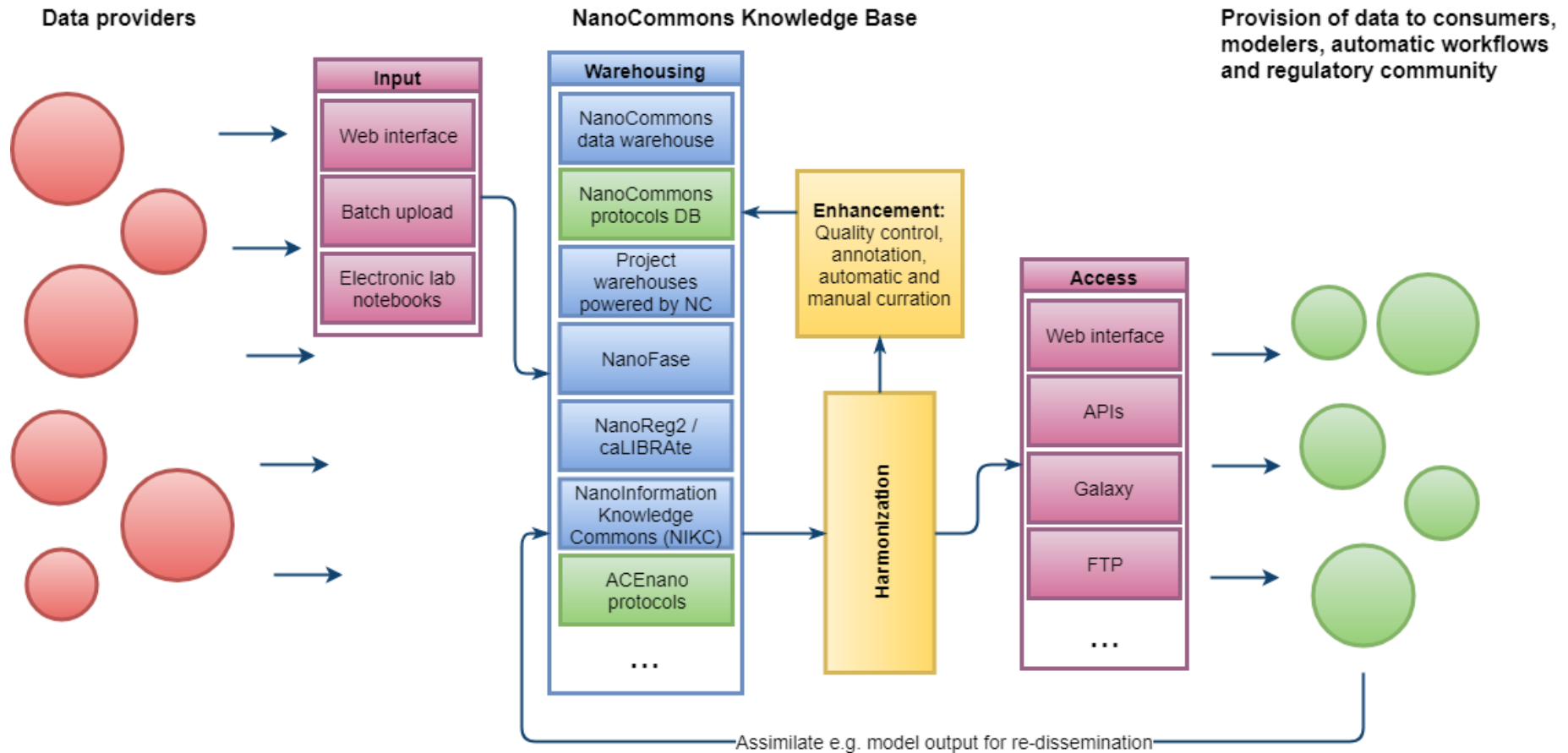
Metadata Management

Scientific Master-Data Management

**Data Management Process**

Data Integration

# NanoCommons Platform





# NanoCommons Platform



BioXM™ Knowledge Portal

Username:

Password:

Log in



NanoCommons Platform

Search...

- Home
- News
- My Profile
- Help
- Help Desk
- Analysis
- Browse Ontologies
- Data Access
- Data Upload

BioXM

Folder (0) Collect Admin

Welcome to the NanoCommons Knowledge Base



Analysis



Data Access



Upload Data



Ontologies

# NanoCommons Knowledge Infrastructure



NanoCommons  
Nano-Knowledge Community

## Events

The NanoCo  
develop the  
community. Th  
predict

This page contains resou  
services and tools availa  
information on our publicat

Category  Organisations involved  Role

Event	Organisations involved
EPPN Workshop (European Network for Pilot Production Facilities and Innovation Hubs) Workshop 5 Nov 2019 / San Sebastian, ES	Bundesinstitut für Risikobewertung (BfR) BioNanoNet (BIONANONET)
OpenTox Euro 2019 Conference, Workshop 29 - 31 Oct 2019 / Basel, CH	Edelweiss Connect GmbH (EwC)
OpenRiskNet Final Workshop Training, Workshop 23 - 24 Oct 2019 / Amsterdam, NL	The University of Birmingham (UoB) Edelweiss Connect GmbH (EwC) National Technical University of Athens (NTUA) National University of Ireland Dublin - University College Dublin (NUID-UCD) Universität Salzburg / Paris Lodron University of Salzburg (PLUS) Universiteit Maastricht (UM)
EU-U.S. NanoEHS Communities of Research (CORs) Workshop Workshop 15 - 16 Oct 2019 / Aix en Provence, FR	The University of Birmingham (UoB) Universiteit Maastricht (UM)
NanoSafety Cluster We Training, Conference, Wor 7 - 10 Oct 2019 / Copenha	
Science is Wonderful Trade show / Exhibition 25 - 26 Sep 2019 / Brussels, BE	

For access to  
Services, Resources & Events:  
[www.infrastructure.nanocommons.eu](http://www.infrastructure.nanocommons.eu)

Category

Jaqpot 5 Cor  
In Silico Mod

Train, deploy and  
learning models

Jaqpot 5 is a user-fr  
model developers t  
through the web. T

Provided by: National  
Type: Modelling tool  
Applicability domain:  
assessment  
Topic: Read-across, (C  
Information extractio

Category  Target

Introduction to data /meta  
A. Papadiamantis, E. Valsami Jones, I.  
18 Oct 2019

OpenRiskNet webinar rec  
10 Sep 2019  
→ OpenRiskNet library

Introduction webinar to G  
9 Sep 2019

Introductory video on Nan  
Cloud Platform  
9 Sep 2019

12.NanoTrus

# TA Calls

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- NanoCommons Transnational Access (TA) provides **funded access** to state of the art **nanoinformatics and data management tools and modelling and risk assessment services**, and the expertise to implement them successfully.
- Researchers from academia and industry are invited to access the **NanoCommons services, facilities and knowledge** to advance their work, solve problems and take their research to the next level



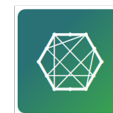
## Experimental Workflows Design & Implementation

*Automated data acquisition, online lab-books, data curation templates, nanoinformatics implementation*



## Data Processing & Analysis

*From data cleansing, mining and analysis to modelling*



## Data Visualization & Predictive Toxicity

*Omics, QSARs, modelling and risk assessment tools*



## Data Storage & Accessibility

*Data repositories, storage, harmonized and interoperable online access*

# TA Calls – *USER BENEFITS*

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- Support from technical experts in NMs data management & nanoinformatics:
- Guidance on implementation of data management best practices (experimental design & data generation)
  - FAIR data
  - Data mining
  - Data harmonization (using ontologies and semantic mapping of datasets and databases)
  - Data utilization and re-utilization (including data visualization and predictive toxicology)
  - Model development
  - Data curation & quality assurance
  - Data Storage



# NanoCommons Online Training Tools


TA service category	Nanoinformatics services	Training formats	Level
Experimental workflow	PC characterization protocols	Written tutorial	Basic
Data processing & analysis	Biomax data templates	Recorded webinar	Basic
	NIKC data templates	Written tutorial	Advanced
	Jaqpot platform	Demo video	Advanced
		Demo video	Expert
	Enalos NanoXtract for TEM image analysis	Demo video	Basic
		Online tutorial	Basic
	Biocorona <i>in silico</i> modelling	Recorded webinar	Advanced
	OpenRiskNet e-infrastructure	Recorded webinars incl. demo videos	Basic
Recorded webinars incl. videos and documentations		Advanced	
Data visualization & toxicity prediction	Enalos cloud for zeta potential	Demo video	Basic
		Recorded webinar	Basic
	Enalos cloud for Safe-by-Design	Demo video	Basic
		Online tutorial	Basic
Data storage	SciNote		
	ACE nano Knowledge		

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# Added Values for Users

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- Access to the **latest protocols** and **best practices** for NMs PC characterisation for safety assessment
  
- Access to **associated data capture templates** fully annotated to **community-agreed ontologies** and **integrated with databases and repositories**
  
- Support by experts:
  - Online Transnational Access (TA) calls
  - Case studies / Helpdesk service



**NEXT CALL:  
March 2020 rolling**



**NanoCommons**

Nano-Knowledge Community



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*Contact us if you have any questions or queries*

***We would be happy to help you!***

Find us:



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