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

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

- **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 of nanosafety research and regulation dramatically
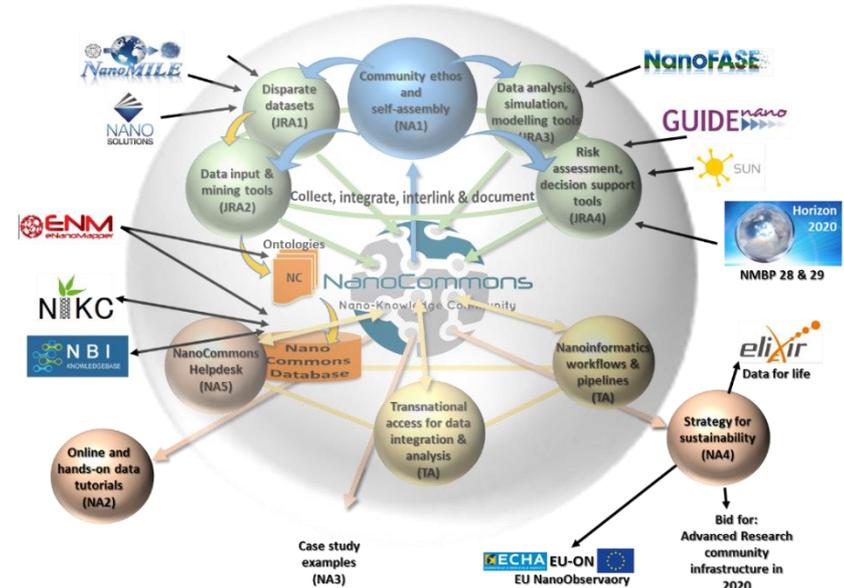
NanoCommons is creating an **e-infrastructure** for reproducible science, **enhancing data integration & enabling nanoinformatics workflows** to address these gaps

The offer

- 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 NEMs

- 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 also access to **Trainings**, accessible through the **NanoCommons Infrastructure Platform**

The approach

- Facilitate **identification** of potential **NM-related risks**

- Enable **'safe-by-design'** approaches

- **Support regulatory decision making** by ensuring data exploitation to assess "sameness", allow read-across
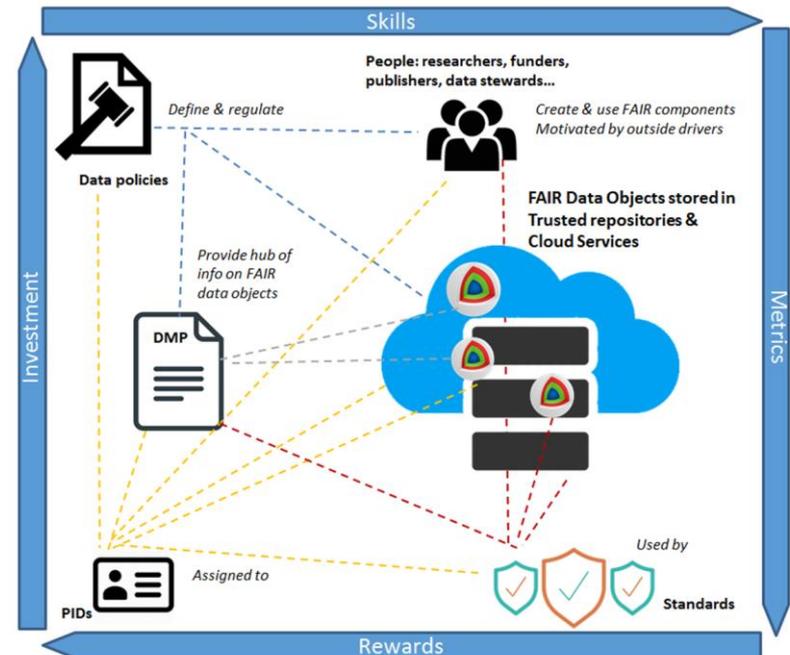

- Create a **FAIR data ecosystem** for data integration, sharing, enrichment and **full exploitation**

- Enhance **public and expert engagement** through open debate on the benefits, risks and safe use of nanotechnology

The impact

- **Remove barriers** from nanosafety **regulatory and industry** processes

- Develop an **integrated Knowledgebase** to facilitate development and application of regulatory tools such as **grouping & read-across**

- Create an **interconnected community** via a **FAIR data single market**

- Enable **full exploitation of EU-funded research data** & promotion of **data driven innovation** leading to **positive socioeconomic impact**
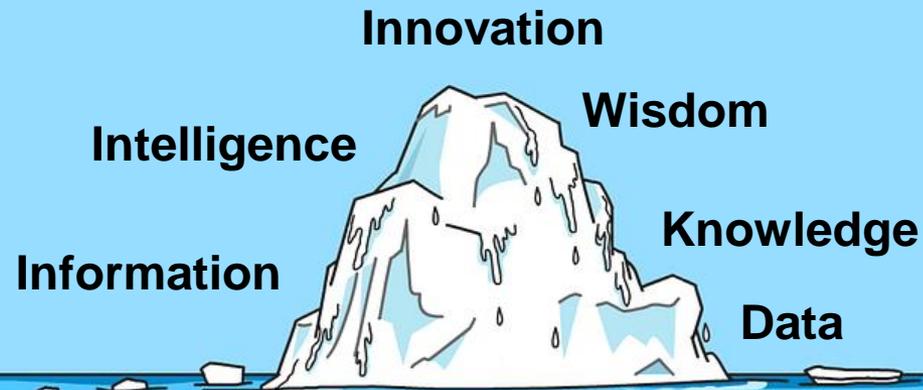
Data Driven Innovation

Innovation

Wisdom

Intelligence

Knowledge

Information

Data

Data Driven Innovation

General Overview of the Project
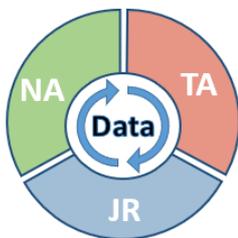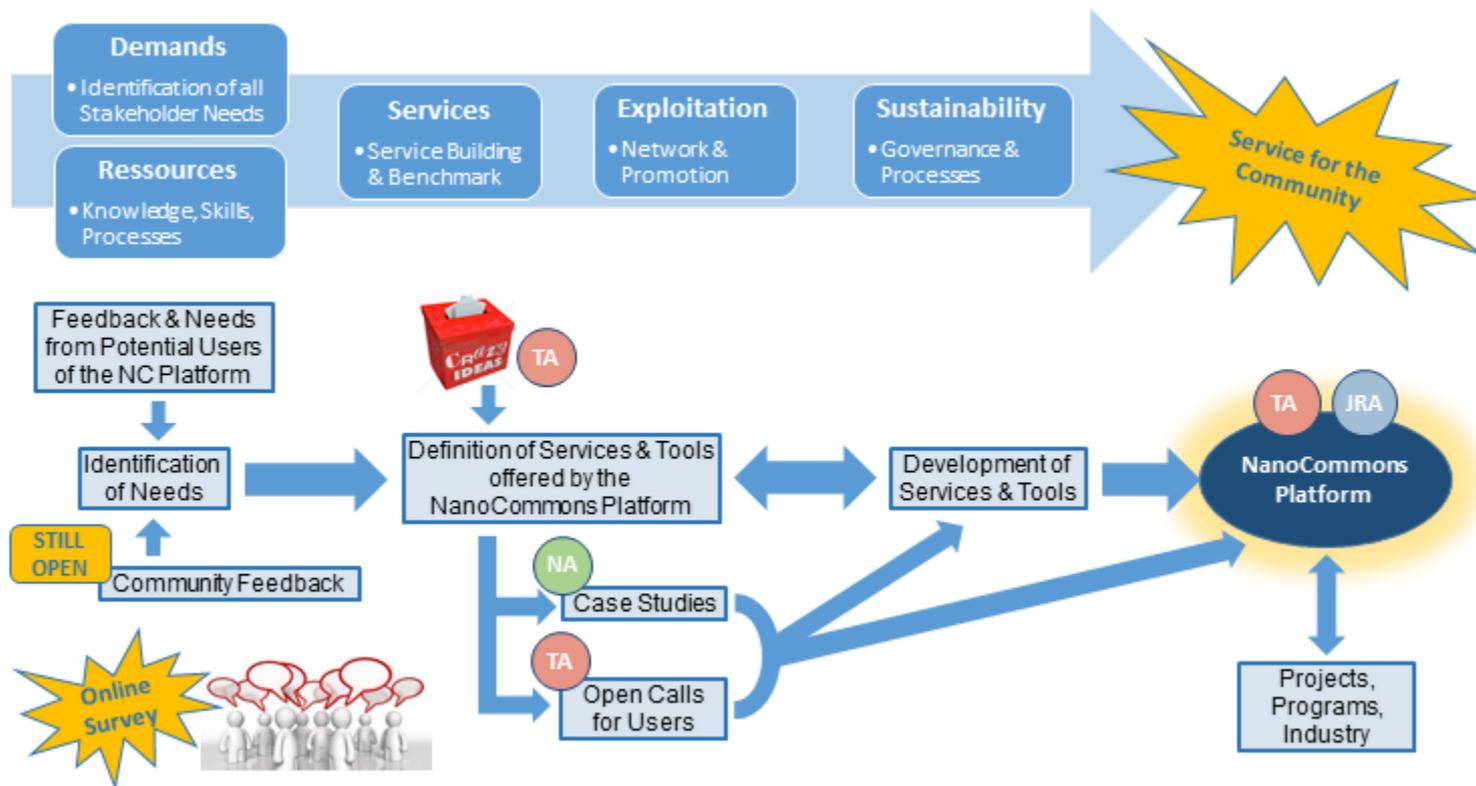
Networking Activities (NA):
To integrate existing resources and embed efficient data management processes from the data generation step (facilitated using online laboratory notebooks), to (efficient and harmonised) data curation, preservation and provision of Open and FAIR access to data/models.

Joint Research Activities (JRA):
To span community needs assessment through the development of demonstration case studies (e.g., regulatory dossiers).

Transnational Access (TA):
To provide users with funded access to the data and/or methods and tools generated or developed under the project. NanoCommons also offers expert guidance along the entire data lifecycle (experimental workflows, data acquisition/analysis/storage, metadata generation, publications etc.) ensuring data quality, completeness and harmonisation into the future.

NanoCommons Platform
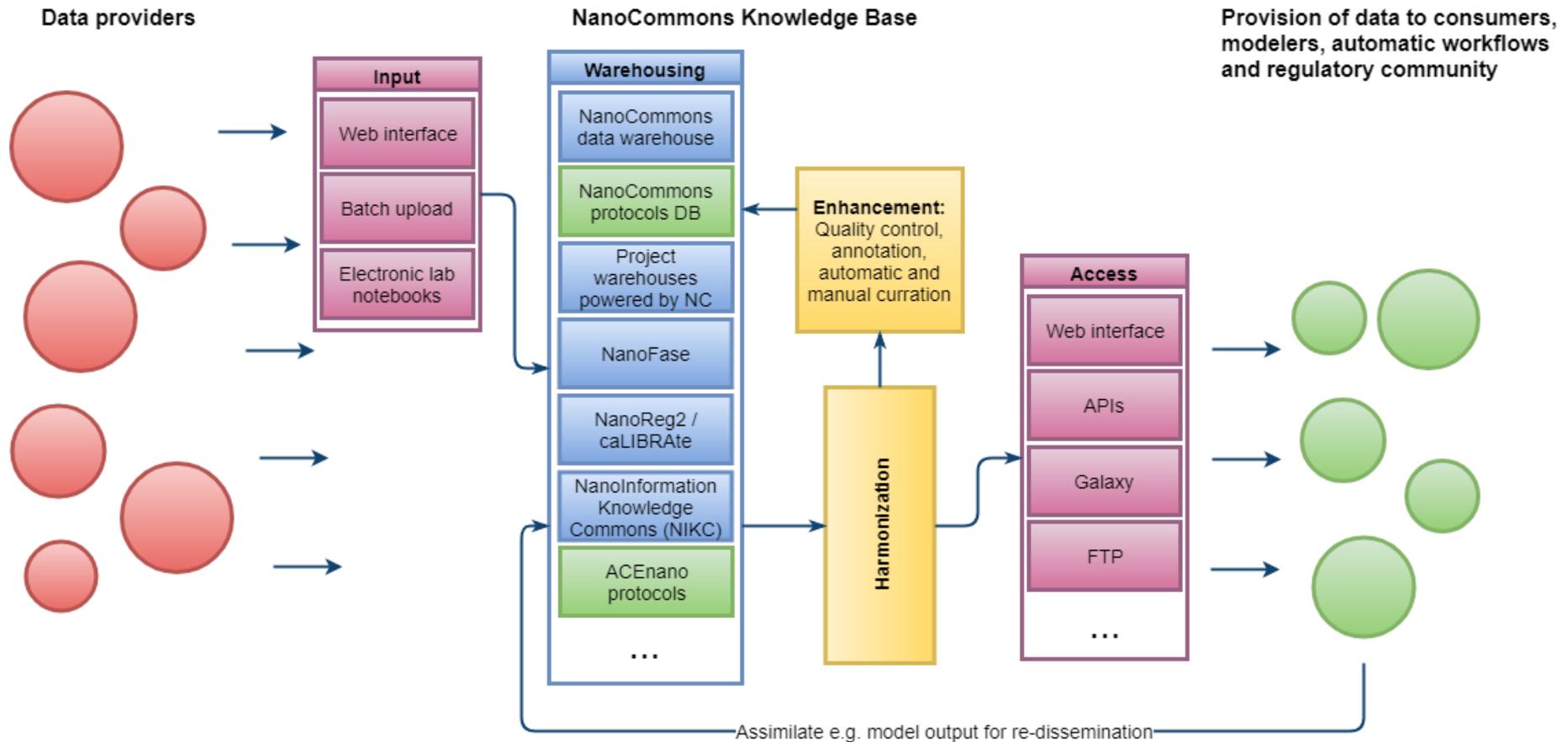
NanoCommons Platform

NanoCommons Knowledge Infrastructure

Events

| Category | Organisations involved | Role | **Filter** | Reset | | **Submit an event** |

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) Universitat 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 Week Training, Conference, Workshop (co-organized by NanoCommons) 7 – 10 Oct 2019 / Copenhagen, DK	
	Universitat Salzburg / Paris Lodron University of Salzburg (PLUS)
Science is Wonderful Trade show / Exhibition 25 – 26 Sep 2019 / Brussels, BE	The University of Birmingham (UoB) NovaMechanics Ltd (NovaM)

The NanoCo…
develop tho…
community. Th…
predict…

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

Category

**Jaqpot 5 Con…
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, (…
Information extractio…

Category		Targe…

Filter Reset

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 Nar…
Cloud Platform**
9 Sep 2019

> For access to Services, Resources & Events:
> ☞ www.infrastructure.nanocommons.eu

TA Online Calls – *WHAT?*

- 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
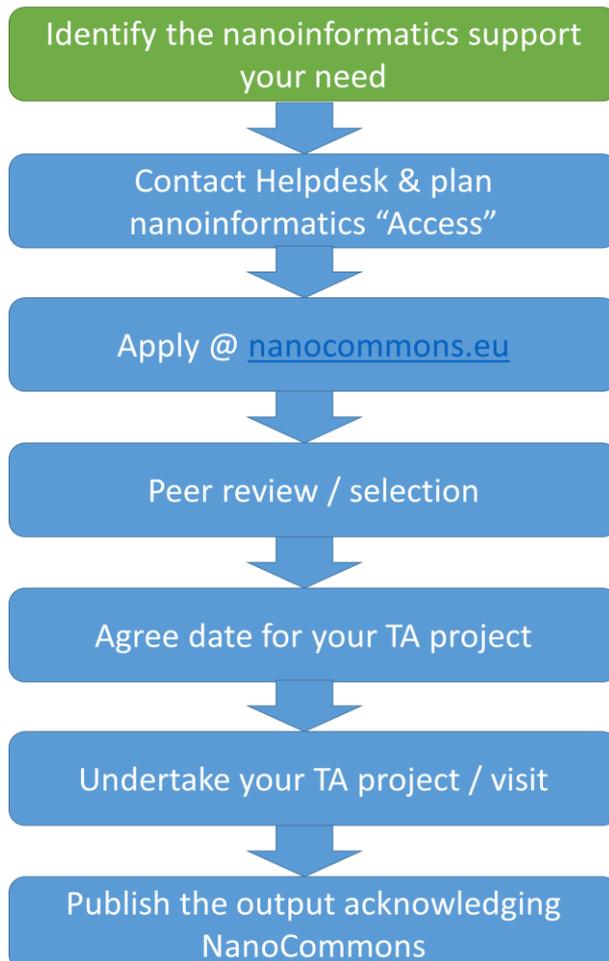
TA Online Calls – *HOW?* (1)

- Users have access to the full knowledge of NanoCommons' **TA technical experts**

- **Submission** of proposals: Electronically via NanoCommons website

- **Travel expenses** for TA users: Reimbursed by EC

- **Selection** of users: Open competition

- 6-monthly application **deadlines**

- TA projects **completed** within 1 year of the offer

TA Online Calls – *HOW?* (2)

Application Process:

Identify the nanoinformatics support your need

↓

Contact Helpdesk & plan nanoinformatics "Access"

↓

Apply @ nanocommons.eu

↓

Peer review / selection

↓

Agree date for your TA project

↓

Undertake your TA project / visit

↓

Publish the output acknowledging NanoCommons

Proposal submission:
www.nanocommons.eu/ta-access

HELPDESK:

helpdesk@nanocommons.eu

Conditions of Access:
NanoCommons promotes **Open and FAIR data:**
TA-funded projects are encouraged to publish Open Access and share data via Creative Common Licenses.
Funding from NanoCommons must be acknowledged in all outputs (posters, talks, papers, blogs etc.).

TA Online Calls – *FOR WHOM ?*

- **Users** of the NanoCommons TA services:

  - Individuals
  - Laboratories
  - Research centers
  - Multi-site projects

  Nanosafety projects and individual researchers from industry, academia and regulatory bodies

→ @ EU member states and associated states

TA Online Calls – *USER BENEFITS*

- **Benefits** for Users → Get support from our technical experts in nanomaterials data management and nanoinformatics:

  o Guidance on implementation of data management best practices (experimental design & data generation)

  o FAIR data

  o Data mining

  o Data harmonization (using ontologies and semantic mapping of datasets and databases)

  o Data utilization and re-utilization (including data visualization and predictive toxicology)

  o Model development

  o Data curation & quality assurance

  o 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 *in silico* 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
	GUIDEnano	Recorded webinar	Basic
Data storage	SciNote	Demo video	Basic
		Online tutorial	Basic
	ACEnano Knowledge Infrastr...		...c

For access to Services, Resources & Events:
☞ www.infrastructure.nanocommons.eu

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Conclusions:
Additional Values for Users

- Added values for Users:

  o Access to the latest protocols and best practices for nanomaterials physicochemical characterisation for safety assessment

  o Access to associated data capture templates fully annotated to community agreed ontologies and integrated with databases and repositories

  o Support from TA-Experts:
    - Online Calls
    - Industrial Case Studies / Helpdesk Service

**NEXT CALL:
February-March 2020**

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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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in NanoCommons