



### Welcome to the 23rd NSC Newsletter

As always, the first thing to be done is to hope that all is well with you, and then to extend enormous thanks to everyone for the wealth of contributions to this 23rd edition and for your continued support. This extended issue has been published slightly later than usual to include a focus on the Venice Training School, so thank you for your patience!

This is possibly the largest newsletter to be produced since the publication first began in 2013. At the time, the NSC projects were funded under the FP7 programme and included old friends such as NanoFATE, NanoPUZZLES, NanoValid, QualityNano and NanoMILE. Many of these were the forerunners of current Horizon 2020 initiatives, which in turn are paving the way for the forthcoming Horizon Europe projects. The importance of communicating and disseminating research outcomes has come to the fore, and ensuring the sustainable impact of our research is paramount.

It seems timely, therefore, to revisit the introduction to the first newsletter: a welcome by Georgios Katalagarianakis and Nicolas Segebarth, who were then leading the European Commission DG for Research and Innovation and to whom the idea of this newsletter can be attributed—it’s clear that their words still stand strong and true:

“It is with great pleasure that we welcome this first issue of the NanoSafety Cluster Newsletter!”

Research outcomes must actively be communicated. Scientists are well aware of this and regularly publish in scientific journals: scientists talking to scientists. While this is essential, it is not enough. Research must also be communicated to the outside world: to innovators, to the public, and to decision-makers. This is a fundamental aspect of EU-funded projects and is particularly relevant for nanotechnology research, not only for its likely contribution to an economic recovery but also for its societal, environmental and health potential implications.

It is also crucial that scientists come together and discuss research findings and strategies. Together with the need for greater research efficiency, this has led to the creation of the NanoSafety Cluster, an open forum for cross-project collaboration, policy elaboration and forward

[...] The work on safety is not an end in itself. As for other technologies, risks have to be assessed and managed if deemed beyond acceptable levels, in compliance with present or future regulation.

Research work therefore advances into areas of knowledge and technological development for regulatory support. Development of skills, international cooperation, standardisation, networking and benchmarking of research players are issues and challenges of equal importance. The aim is to reduce uncertainties about environment, health and safety, thereby securing confidence in harvesting the benefits from these technologies and materials. Information in these fields of research results take-up and implementation is as equally valuable as the information on research itself.

[...] We expect [this newsletter] to reach a much wider community than the cluster members and are confident that it will contribute to increasing the visibility and the impact of European research. We hope that this newsletter will become a reference information exchange board at the service of the European and the global nanosafety research community.”

**Georgios Katalagarianakis & Nicolas Segebarth**  
European Commission  
DG for Research and Innovation



Once again, we very much hope you find this extended newsletter of interest and look forward to receiving your submissions for the next issue.

**Submit** your news, project updates, opinions, events, publications, and opportunities **by 10th September 2021**

Submit your news [here](#)  
Subscribe to the Newsletter [here](#)

**Take care and stay safe**  
Kind regards  
**Lesley Tobin**  
[news@nanosafetycluster.eu](mailto:news@nanosafetycluster.eu)





## CONTENTS

### NSC NEWS

News from the Coordination Team	3
NSC Workshop at ENF 21	4

### THE VENICE TRAINING SCHOOL

Overview of sessions	5
Session Focus: Risk Governance	8
Session Focus: SAbYNA Roleplay Workshop SbyD	10
Abstract Focus: TheKaRL approach to knowledge readiness	11

### NSC PROJECT NEWS

NMBP-13 Projects Bring Risk Governance to the Table: ENF21 and ACHEMA	12
NMBP-14 NanoInformaTIX presents its first results	13
NMBP-14 NanoSolveIT makes freely available a library of critical characteristics for 69 engineered nanomaterials	15
NMBP-14 NanoSolveIT Open toxicogenomic data project improves our knowledge for nanomaterials toxicity	16
NMBP-15 The ASINA Project presents the Early Career Researchers Group	17
NMBP-15 SAbYDOMA: Videos showing the first developments of SAbYDOMA's technology	18
NMBP-15 SbD4Nano General Assembly Meeting	19
NMBP-16 SUNSHINE Goes Live!	20
NMBP-16 H2020 DIAGONAL Spotlight	21
ACEnano holds its final stakeholder event	22
NanoCommons: The MIE prediction tool webinar	23
NanoCommons and NanoSolveIT: "Online QSAR Modelling Hackathon"	25
NanoHarmony webinar attracts over 280 registrants	27
NanoHarmony Survey: best practice for guidelines	27
NanoHarmony workshop: 'Learning lessons from the past – and knowing what your customer needs'	28
NanoExplore—news and updates	29
PATROLS : workshop on advances in nanomaterial human and environmental hazard ass. methods	30
BIORIMA Project: news in its final year	31
BIORIMA reports on NanoTox 2021	32
H2020 GRACIOUS Project - events and dissemination activities	34
CHARISMA shares its latest developments	35
NanoPAT reports its progress in Newsletter #2	36
NanoPAT – Process Analytical Technologies for Industrial Nanoparticle Production	37
NanoReg2 Filling the Nanosafety Data Gaps: Towards FAIR Nanosafety Data.	39

### NEWS FROM OTHER INITIATIVES

TNO Launches LICARA Innovation Scan	40
CUSP Launch —From Early Life to Adulthood: What's the impact of micro-/nanoplastics in the human body?	41
BIO-PLASTICS EUROPE and SEALIVE - EU Policy focus	44
Opportunities to contribute to ECHA/EUON market research study	45
BNN Newsletter out now	45
The NanoLabNL Newsletter	45
SweNanoSafe – website now in English	45

### CALL FOR PAPERS

NanoImpact—Special Issue on Micro-and Nanoplastics: Environmental and Health Implications	46
Frontiers of Nanotechnology and Toxicology	46

### PUBLICATIONS

PATROLS reports on its excellent output	47
SARS-CoV-2-Laden Respiratory Aerosol Deposition in the Lung Alveolar-Interstitial Region ...	48

### JOBS AND OPPORTUNITIES

Research engineer (LTE) Modelling and characterization of a model aerosol ...	49
---	----

### EVENTS

PATROLS public workshop, Nanomed Europe 21, NIA Symposium, NMBP-13 online workshop	50
--	----

### ABOUT THE NANOSAFETY CLUSTER

52



## News from the NSC Coordination Team

Within recent months, a huge success story of European research received a boost of attention: **the concept on safety and sustainability by design** has become popular. There is no doubt that the nanosafety community has had from the beginning a leading role in those developments.

The NSC Coordination team (CT) has put a great deal of effort into interacting with relevant stakeholders and will continue this by directly participating in forthcoming funding opportunities under the new Horizon Europe work programme. To maximise impact, we envisage joining forces with other advanced materials and chemicals communities e.g. Sustainable Chemistry community. In this way, we aim to ensure we will be able to further support the NSC community, to foster the uptake and integration of the methods and concepts developed within the nanosafety field, and thus to enable you all to maximize the impact of your achievements as well as progress further towards SSbD, addressing the challenges of different value chains.

Some actions mentioned here in terms of contributing to the shaping of European and international collaborations towards safe and sustainable research and development include our response to a request from the European Commission, whereby we supported the creation of the **EC-mapping study** adding a **collection** of the NSC projects` scope, application areas and main (expected) outcomes. We give big thanks to the coordinators of ASINA, DIAGONAL, GRACIOUS, HARMLESS, SABYDOMA, SABYNA, SbD4Nano and SUNSHINE for your contributions to this exercise. These efforts have also been used as supporting information for the **EC workshop** “Safe and Sustainable-by-Design criteria for chemicals, materials and products - First Stakeholders workshop”, held on March 19<sup>th</sup>, 2021.

The CT was also busy following up the decisions from the EU-Asia dialogue from 2020, which matured towards a global collaboration initiative entitled **INISS-nano** (International Network Initiative on Safe and Sustainable nanotechnology). This **concept paper** is intended to prepare the ecosystem for global collaboration in fields of action, so called pillars, dedicated to **harmonisation, support industrial understanding, sharing/facilitate sharing of resources/infrastructures, and ethical aspects** (other pillars might appear at a later stage), enabling “collaboration without borders” within joint projects, joint funding initiatives, and any additional ways of cooperation. The concept paper is open for comments, which shall be sent in before August 17<sup>th</sup>, 2021.

In parallel with these activities, the CT has prepared (and submitted) a paper to digest the NSC’s experiences in recent years and our perspective on the future of nanosafety. We hope to be able to share more information with you about this in the near future.

Besides the output generated to support the nanosafety community on its journey towards Horizon Europe, the CT organized a satellite **NSC event** in the frame of EuroNanoForum 2021, to open the stage for NanoSafety community, presenting “**The delivery/usability of S(S)bD for science, regulators and the industry**”. The online event attracted ~100 participants, listening to great presentations delivered over three sessions: (i) Delivery from science, (ii) Expectations from regulators, and (iii) Perspective from nanofabrication side. The final session of the afternoon was dedicated to online-networking, which worked well as a virtual coffee break. It enabled an open forum for participants to get to know each other in an informal way, using an online-tool that we will adopt for forthcoming NSC events. All presentations of the event are available on the **NSC YouTube channel**, another benefit of online engagement.

Within the frame of the projects BIORIMA, GRACIOUS and PATROLS, the **international Conference on nanotoxicology** “NanoTox2021” took place in April. Once more, this was a great showcase of the power of the NanoSafety Cluster community in this discipline, and to promote science to the international community. Later on in June, we celebrated the 10<sup>th</sup> anniversary of the Venice **NanoSafety Training School**. The program - “From Basic Science to Risk Governance” - was delivered online and offered high quality training based on joint efforts brought to the table by the projects BIORIMA, Gov4Nano, GRACIOUS, NanoInformatIX, NANORIGO, PATROLS, RiskGone, and other initiatives involved in the program.

Finally, this month saw the end of analytical flagship project ACEnano, and a dedicated **article** about the projects final stakeholder workshop appears later on in this issue.

We hope you enjoy this 23rd edition of the NSC Newsletter.

**We wish you a nice summer and look forward meeting you again soon.**

**Éva Valsami-Jones, Flemming Cassee, and Andreas Falk**





## The NanoSafety Cluster Workshop

### EuroNanoForum 2021



Under the Portuguese Presidency of the Council of the European Union in the first half of 2021, EuroNanoForum 2021 addressed Nanotechnology and Advanced Materials as the key elements to guarantee the functioning, long term durability, safety, and environmental compatibility of many devices, machinery, and services.

Advanced materials will be fundamental for the transition to greener technologies, and a more sustainable future, making a significant contribution to the ambitious goals set by the European Green Deal. Within this context, the NSC organised a virtual workshop on **“The delivery/usability of S(S)bD for science, regulators and the industry”**, held back to back with ENF21 on May 4th.

#### Part 1—“Delivery from science”

10 minutes of videos presenting scientific tools in development, and aiming to deliver usable S(S)bD-tools for real-life applications

#### Part 2—“Expectations from regulators”

10 minutes with two presentations by regulators

#### Part 3—“Perspective from nanofabrication side”

10 minutes with two presentations by nanofabrication-experts (industrial)

#### Part 4—“Open discussion forum”

60 minutes connecting with NSC-colleagues

The complete playlist of the workshop videos can be [viewed here on the NSC YouTube Channel](#)

Part 1	14:00 – 14:20	<b>“Delivery from science”</b>	Chair: <i>Eva Valsami-Jones</i>
10 minutes of videos presenting scientific tools in development, and aiming to deliver usable S(S)bD-tools for real-life applications			
Videos will be available at the <a href="#">NSC-YouTube-Channel</a> already before the Event (envisaged for April 30 <sup>th</sup> ) and will be stored there to be accessible also after the event.		Each participant will be invited to use these 10 minutes to watch any videos he or she selects from the collected contributions.	
Virtual room Q&A based on chat questions/comments			Eva Valsami-Jones, coordination team NSC
Part 2	14:20 – 14:40	<b>“Expectations from regulators”</b>	Chair: <i>Flemming R. Cassee</i>
10 minutes with 2 presentations by regulators			
Safe and Sustainable-by-Design <sup>®</sup> : Current definitions and approaches		Ronald Flippo, Ministry of Infrastructure and Water Management, The Netherlands	
A the policy perspective on Safe-by-Design in nanotechnology		Xenia Trier, European Environment Agency - Integrated Environmental Assessment, Green Economy group	
Virtual room Q&A based on chat questions/comments			Flemming R. Cassee, coordination team NSC
Part 3	14:40 – 15:00	<b>“Perspective from nanofabrication side”</b>	Chair: <i>Andreas Falk</i>
10 minutes with 2 presentations by nanofabrication-experts (industrial)			
“Sustainability aspects in nanofabrication from the perspective of a SME in the PV sector”		Fernando de la Vega, PV NanoCell	
“Sustainability and safety implementation in upscaling of production methods”		Patricia M.A. Farias, UFPE/PHORNANO Holding GmbH	
Virtual room Q&A based on chat questions/comments			Andreas Falk, coordination team NSC
Part 4	15:00 – 16:00	<b>“Open discussion forum”</b>	Chair: <i>Eva Valsami-Jones</i>
60 minutes time for you to connect (virtually) with NSC-colleagues			
Short introduction about the interactive tool to enable a smooth “get2gether”			Eva Valsami-Jones, coordination team NSC

**What NSC WG-A offers for SSbD in industrial & regulatory processes**

Martin Himly (PLUS)  
Chair WG-A Education, Training, Communication

[www.nanosafetycluster.eu](http://www.nanosafetycluster.eu)

NSC Event @ EuroNanoForum, 2021-05-04, #martinhimly, #nanocommons

Powered by projects that receive funding from the European Union Horizon 2020 Programme (H2020) under grant agreements no: 731032 & 814572

CC-BY 4.0 International

NanoSafety Cluster - EuroNanoForum 21

NanoSafety Cluster - 1 / 11

- 1 ENF NSC PART 1 - NSC WG-A Facilitating integration of... NanoSafety Cluster 7:03
- 2 ENF NSC PART 1 - S Tanasescu NanoSafety Cluster 6:58
- 3 ENF NSC PART 1 - SUNSHINE e infrastructure NanoSafety Cluster 3:26
- 4 ENF NSC PART 1 - SbD: In vivo in vitro dose equivalence NanoSafety Cluster 4:47
- 5 ENF NSC PART 1 - SABYDOMA Pitch NanoSafety Cluster 4:11
- 6 ENF NSC PART 1 - SaByNA Conference Intro NanoSafety Cluster 1:16

All Computers and information t... Present >



## The Venice Training School 10 Years of Nanosafety Training from Basic Science to Risk Governance

**Leveraging Interprofessional Education to the Study of Nanosafety:  
From Basic Science through Safe-by-Design and Nanomedicine to Risk Governance**

**Fostering dialogue about risk assessment and management and safe-by-design of nano-(bio)materials through cross-cutting insights from nanosafety, nanomedicine and risk governance fields was the mission of the 10th Anniversary of the Venice NanoSafety Training School held online on 21-25 June 2021**

Jointly organized by seven EU funded H2020 research projects (BIORIMA, Gov4Nano, GRACIOUS, NanoInformaTIX, NANORIGO, PATROLS and RiskGONE) and following more than a decade of tradition, this year's Nanosafety Training School took place in an online setting. Unfortunately, because of the pandemic situation and the restriction of physical events, the nanosafety community couldn't meet as usual in beautiful Venice. Nevertheless, the 10th edition of this Nanosafety Training School was successfully held with more than 170 registrants from across the Globe. The programme included different sessions each afternoon, with contributions from many experts with different scientific backgrounds presenting the latest results of EU's nanosafety research arena. The training started with two key note lectures on the Monday afternoon: **Georgios Katalagarianakis (former EU Commission)** talked about "Let's celebrate: Eleven years of the Venice Training School, sixteen years of European Nanosafety research. History, lessons learned and perspectives", while **Steffi Friedrichs (AcumenIST)** introduced "Concepts of sustainable Nanofabrication". After this inspiring start, several sessions were held during the week, combining lectures with interactive sessions.

### From Nanosafety to Nanomedicine: a 10-year Perspective

This session provided a perspective on nanosafety research conducted in the past decade and a view to the application of nanomaterials in medicine. **Bengt Fadeel (Karolinska Institutet)** has been involved in several EU-funded and national projects focused on nanosafety including MARINA and BIORIMA as well as the EU-funded Graphene Flagship. Special focus was put on lessons learned from these projects with emphasis on the synthetic and biological "identities" of nanomaterials and interactions of nanomaterials with biological systems.

### Hazard to Human Health & Environment

In this training session, **Hedwig Braakhuis (RIVM)**, **Sabina Halappanavar (Health Canada)**, **Fiona Murphy (Heriot-Watt University)** and **Samantha Llewellyn (Swansea University)** presented the latest progress in nanomaterial hazard testing. This included the use of the Adverse Outcome Pathway (AOP) concept to unravel the mechanisms behind nanomaterial toxicity. In addition, the use of alternative methods was discussed.

### Fate & Exposure Assessment

This session focused on recent developments in the assessment of fate of exposure of nanomaterials. **Teresa Fernandes (Heriot-Watt University)**, **Socorro Vazquez (LEITAT)**, **Sam Harrison (UK Centre for Ecology & Hydrology)** and **Joris Quik (RIVM)** discussed how to use the basic information on nanomaterial exposure scenarios description to determine the likelihood & route of exposure, and how this information

[Cntd →](#)



[Cntd →](#)

can be used in the assessment and management of exposure to nanomaterials. Next to that, information was provided on how to use models to perform nanomaterial environmental exposure assessment, explaining what these models are, what they include, why they are useful and the different levels of complexity, to make them more realistic and reflecting environmental reality. Participants were able to try some of the models, input some real data, and also analyze the results.

### RRI Roleplay Workshop: Safe-by-Design Sustainability Forum

**Sean Hardy** and **Raquel Bertoldo (Symlog)** held the First Annual Safe-by-Design Sustainability Forum. Since it's now common knowledge that nano-enabled products are important to realizing UN Sustainable Development Goals, the implementation of Safe-by-Design processes have been proposed as a method to achieve these goals. But what does Safe-by-Design mean in the field of nanotechnology? Is it already in practice or are we far away from it? What are its challenges? What does it imply for each stakeholder group? These questions and more served as basis of the session's interactive role-play workshop, which allowed participants to discuss and debate with their peers the various meanings of "Safe/r/ty-by-Design" from their own as well as stakeholders' perspectives.

### Similarity, grouping and read-across approaches

In this session, **Vicki Stone (Heriot-Watt University)**, **Agnes Oomen (RIVM)**, **Nina Jeliaskova (IdeaConsult)** and **Richard Cross (UK Centre for Ecology and Hydrology)** focused on:

- Grouping hypotheses, IATAs and the GRACIOUS Framework
- A quick introduction to Read Across in a regulatory setting
- How similar do nanoforms need to be to allow grouping and read-across
- Environmental case studies for similarity, grouping and read-across

### Risk Assessment & Management

**Alex Zabeo (Greendecision)** provided training in using the BIORIMA Decision Support System. This system employs advanced models to support the occupational, consumer and environmental risk assessment of nanomaterials and biomaterials along the lifecycle of nano-enabled consumer products and medical applications. In situations where the risks are not controlled, the system proposes suitable Risk Management Measures and provides information about the efficacy of these measures.

### Risk Governance

**Martin Himly**, **Sabine Hofer** and **Nobert Hofstaetter (University of Salzburg)**, as well as **Dmitri Ciornii (BAM)** and **Daan Schuurbiens (DPF)** built this session on the question "Risk assessment with social dimension: how does risk governance differ from risk assessment or management?" Starting with introducing the process of risk governance, it was discussed how data support decision-making, what data are needed, and what researchers can do in order to provide such data. This also covered FAIR databases and quality assurance, defined by the Knowledge Readiness Level (KaRL). Next to that, different stakeholder views and how socioeconomic aspects can be included into the risk governance process to warrant inclusiveness for different values into the risk/benefit estimation were discussed.

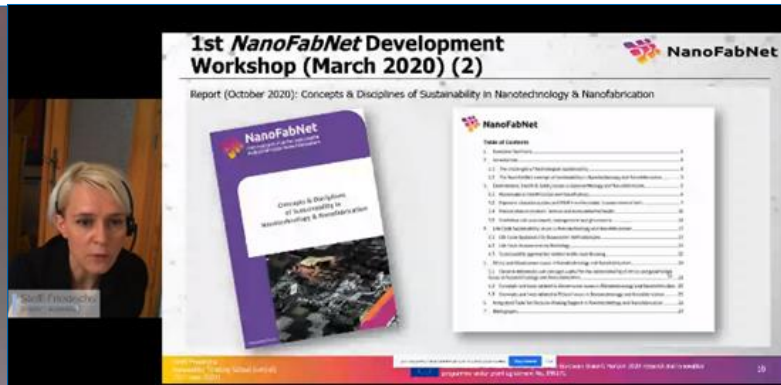
### Modelling

On the last training day, **Giulia Mancardi (Politecnico di Torino)**, **Vio Buchete (UCD)** and **Agur Sevink (Leiden University)** talked about upscale from classical Molecular Dynamics to Brownian Dynamic for nanoparticle clustering and aggregation, nanoparticle-protein docking as well as nanoparticle-membrane interactions.

Although we had to adapt to a fully online event, the Training School was a great success, huge thanks to all speakers and organizers that made it happen. The School's Organizing Team is already looking forward to the next edition of the Nanosafety Training School, hopefully as real physical event in Venice, Italy, in 2022.

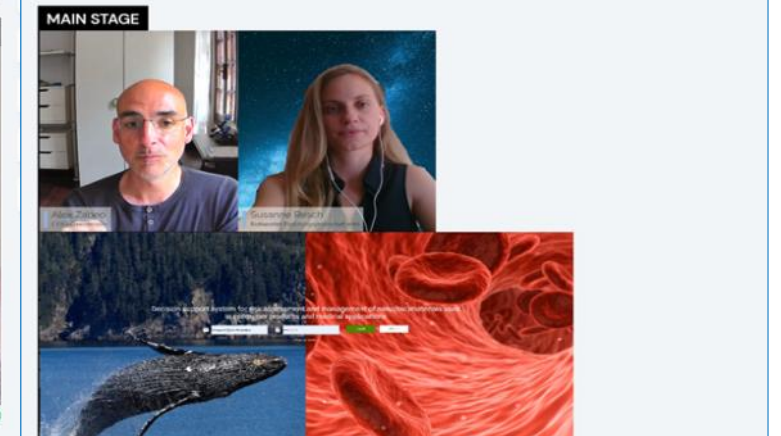
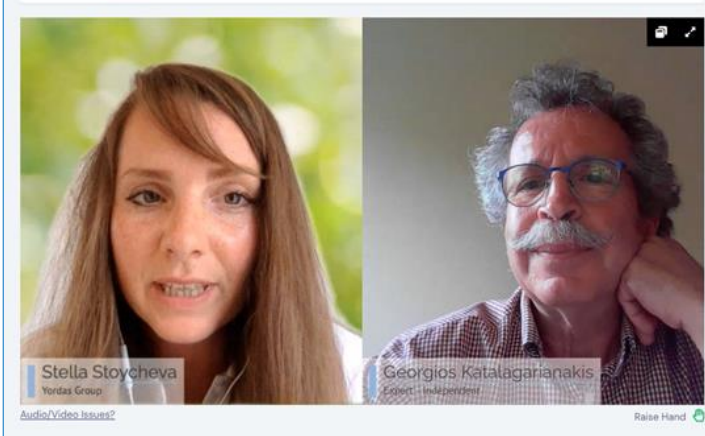
[Cntd →](#)

Cntd →



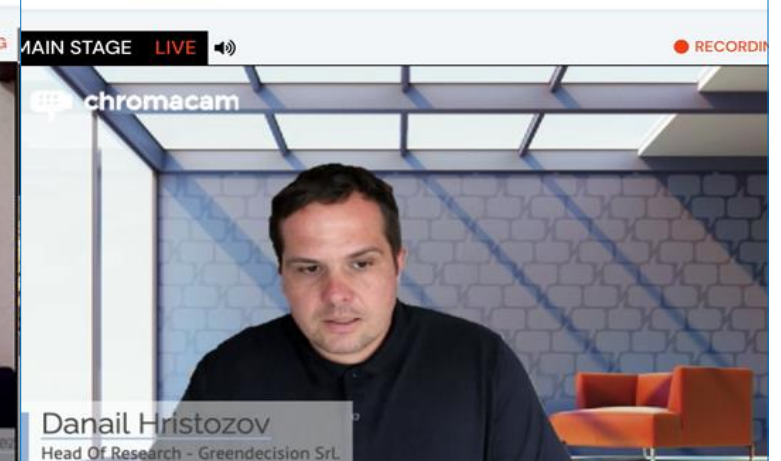
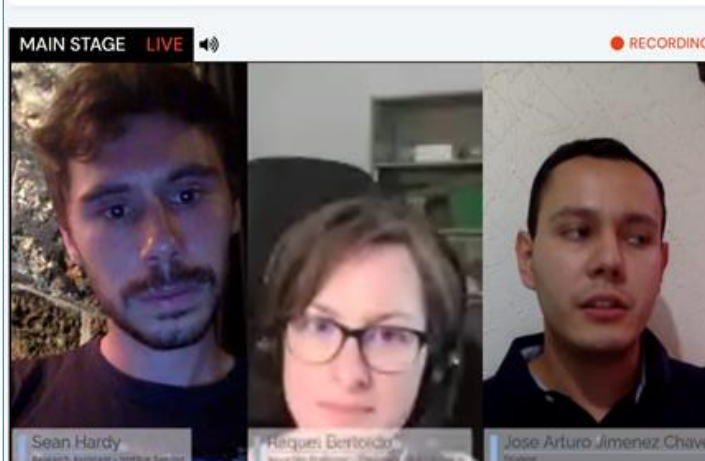
Welcome & Keynote Session  
1:00pm - 2:30pm  
LIVE NOW 44

Risk Assessment & Management  
1:00pm - 2:30pm



RRI Roleplay Workshop: Safe-by-Design Sustainability Forum  
2:00pm - 3:30pm  
LIVE NOW 20

Similarity Assessment, Grouping & Read Across Approaches  
4:30pm - 6:00pm  
LIVE NOW



Connect to us on YouTube for links to the videos.

### Contacts for Press

**Susanne Resch,**  
BioNanoNet Forschungsgesellschaft  
mbH [susanne.resch@bnn.at](mailto:susanne.resch@bnn.at)

**Stella Stoycheva,**  
Yordas Group  
[s.stoycheva@yordasgroup.com](mailto:s.stoycheva@yordasgroup.com)

**Danail Hristozov,**  
GreenDecision S.r.l.  
[danail.hristozov@greendecision.eu](mailto:danail.hristozov@greendecision.eu)

## The Venice Training School—Session focus: Risk Governance

# NANORIGO

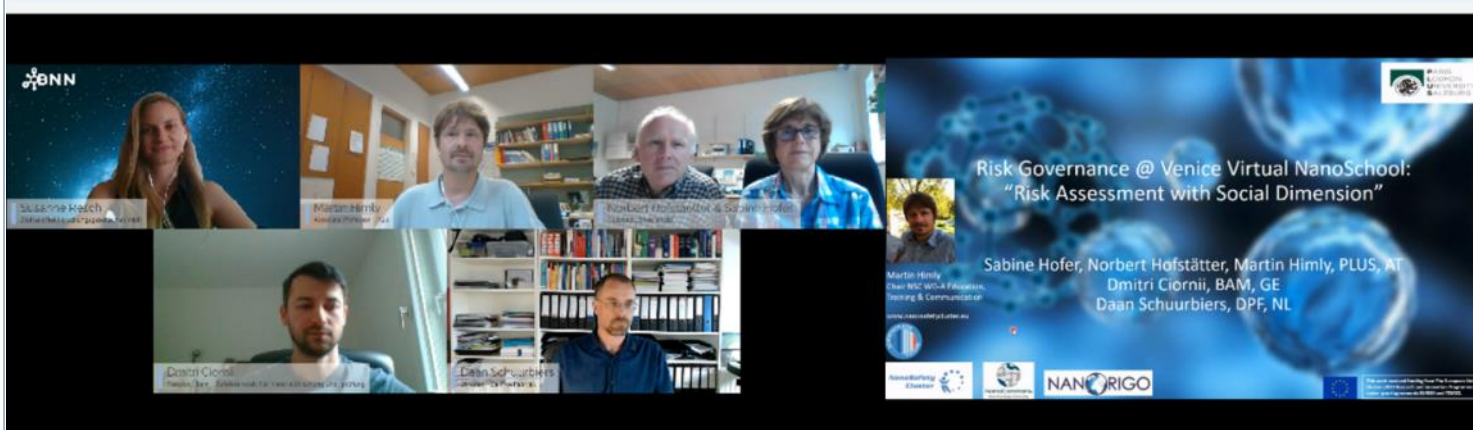


NanoCommons  
Nano-Knowledge Community

On Thu, 24 June 2021 a team representing the EU H2020 projects [NANORIGO](#) and [NanoCommons](#) conducted a session dedicated to the theme of **Risk Governance** at the [10<sup>th</sup> Nanosafety Training School: from Basic Science to Risk Governance - Interprofessional Education Training School 2021](#).



**Risk Governance - Risk assessment with social dimension** ★  
3:30pm - 5:00pm



**Martin Himly, Sabine Hofer** and **Nobert Hofstaetter (University of Salzburg)**, as well as **Dmitri Ciornii (BAM)** and **Daan Schuurbiens (DPF)** built this session around the question “Risk assessment with social dimension: how does risk governance differ from risk assessment or management?”

The webinar started with a short *introduction to the program*, linking nanosafety data and knowledge readiness with the social dimension of risk governance, given by [Martin Himly](#), Chair of the [WG-A “Education, Training and Communication”](#) of the [NSC](#).

Next, [Sabine Hofer](#) introduced the process of risk governance, walking the attendees through the six individual steps for managing the life cycle of risk:

- i. pre-assessment, **to set the stage** for the risk governance process
- ii. scientific (technical) assessment, the **knowledge base synthesis** for subsequent steps
- iii. opinion, concern & risk perception assessment for **capturing public perception and concerns**
- iv. evaluation, a step where the **significance and acceptability of the risk is determined**
- v. risk management for the **treatment and regulation** of the risk
- vi. monitoring and feedback, which aims at the **adoption of measures until the end** of risk life cycle

This session was concluded by [Norbert Hofstaetter](#) with an interactive element raising awareness of the different angles that different stakeholder may approach a specific case in their individual risk perception. Guided by questions participants had the chance to identify in what sense risk governance differs from risk assessment and management.

The data block of the scientific/technical assessment (see above step ii) was introduced by [Martin Himly](#) covering topics such as FAIRness (*i.e.*, Findability, Accessibility, Interoperability, Reusability) of data, metadata completeness, and data shepherding, thereby highlighting the integration of experimental *in vitro* data with *in silico* modelling tools, facilitating enrichment and gap-filling of the still fragmented data landscape in nanosafety assessment.

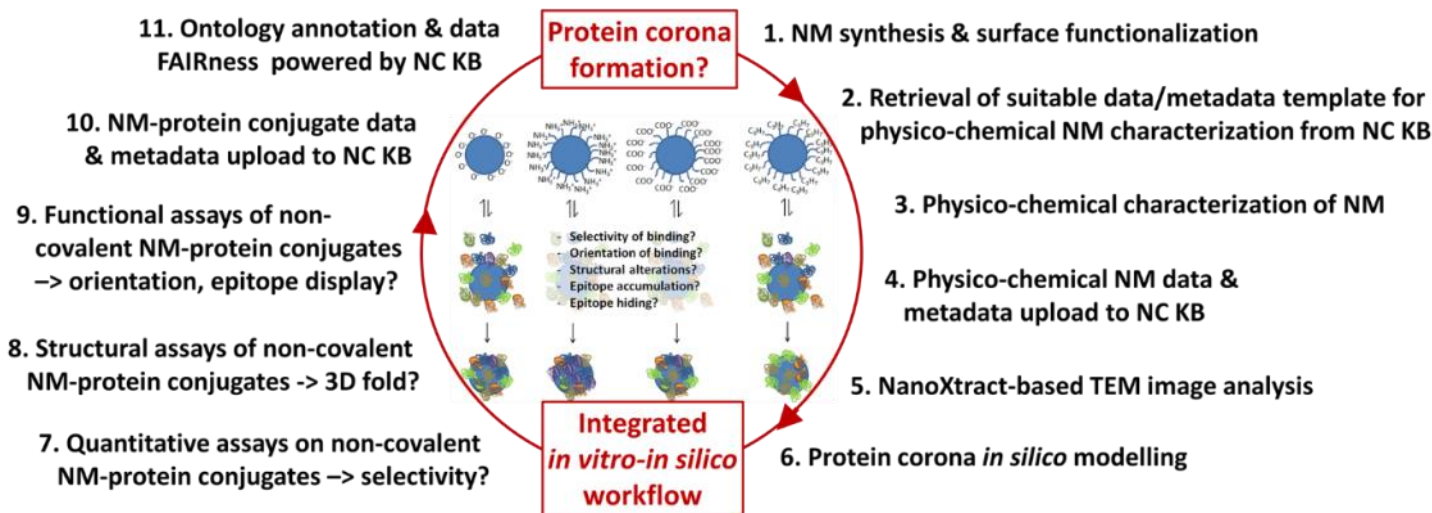
[Cntd →](#)



Cntd →

This workflow was depicted on a specific case of studying protein corona formation and its impact on human hazard assessment, displaying the features of the [NanoCommons Knowledge Base](#).

*The NanoCommons Knowledge Base (NC KB) integrates reliable experimental in vitro data on nanomaterials (NMs), ontology-annotated & metadata-supplemented, with in silico prediction tools*



Within this same thematic block, [Dmitri Ciornii](#) further eluded to quality assurance of data, defined by the Knowledge Readiness Level (KaRL), which, in analogous to NASA’s Technology Readiness Levels (TRLs), defines a categorization system of data, information, and knowledge which enables the transformation of data and information into functional knowledge for nanorisk governance. In this sense, it goes beyond the technical curation of data and metadata, as it further involves quality and completeness filters, regulatory compliance requirements, nanorisk-related tools, and most importantly, human input (inclusion of all stakeholder groups).

Next to that, different stakeholder views and how socioeconomic aspects can be incorporated into the risk governance process to warrant inclusiveness for different values into the risk/benefit estimation were discussed by [Daan Schuurbijs](#). After his input talk the session became more interactive by role playing through the case of E171 in food asking:

- shall we ban TiO<sub>2</sub> in food?
- if you were a policy maker, how would you respond to NGOs / industry?
- how could we improve the governance process?

The webinar presentation slides and the recording (recorded for educational purposes) are available in the [NSC NanoHub](#), the [NanoCommons Infrastructure](#), at [Zenodo](#), the [NSC YouTube channel](#), and in the [NanoCommons’ Elixir TeSS channel](#).



**The Venice Training School—Session focus:**

**SAbYNA delivers a Roleplay Workshop: “Safe-by-Design Sustainability Forum”**

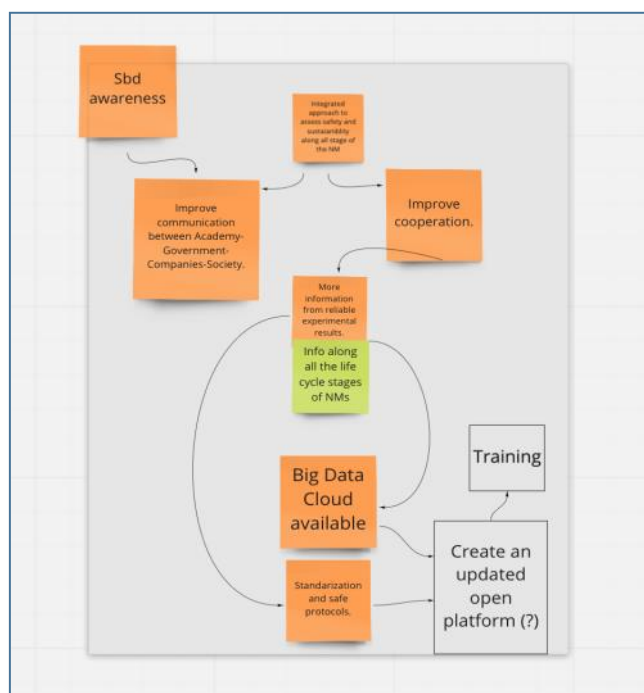
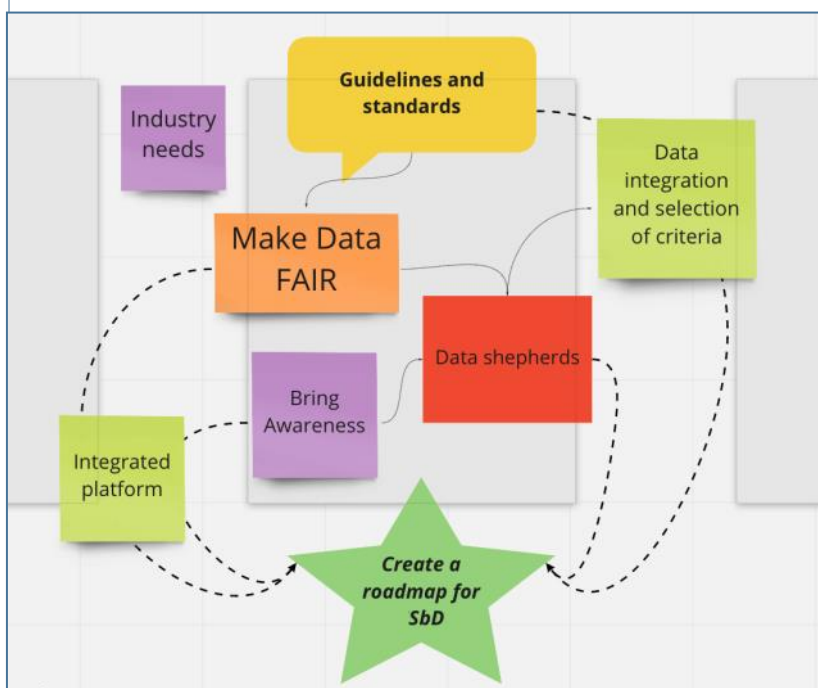
At this year’s online Nanosafety Training School, the Responsible Research and Innovation (RRI) team of H2020 SAbYNA hosted an interactive session entitled “RRI Roleplay Workshop: Safe-by-Design Sustainability Forum”.

The session offered an opportunity for 40 young career researchers across nanoscience disciplines to come together and discuss questions surrounding Safe/r/ty-by-Design. The twist? Participants were invited to roleplay as members of various stakeholder groups (industry, academia, regulators, elected officials, and consumers) participating in a UN Sustainability Summit. Their mission? To provide the Committee with recommendations to help answer the following (nonexhaustive) list of questions: How do we know a nanoparticle or product is “Safe-by-Design”? What are the criteria to say that something is SbD? Is “safety by design” already being achieved?

The groups brought back presentations from their breakouts (figures show two samples) to present in plenary from their stakeholder viewpoint. The workshop concluded with participants reflecting on the origins of their own conceptions of SbD and to what extent these were aligned or misaligned with their assigned role.

SAbYNA will be conducting further workshops with the larger nanosafety community to help us all delve into the divergent multiplicity of meanings of our everyday terminologies. If you’re interested in learning more about our work, helping us shape an upcoming large-scale survey, or participating in similar workshops, please contact us at [rri.sabyna@gmail.com](mailto:rri.sabyna@gmail.com).

Sean Hardy, Raquel Bertoldo\*, Claire Mays (Institut Symlog; \*AMU)



## The Venice Training School—Abstract focus

### The KaRL approach to enable knowledge readiness for nanorisk governance

Damjana Drobne<sup>1</sup>, Dmitri Ciornii<sup>2</sup>, Sara Novak<sup>1</sup>, Eva Kranjc<sup>1</sup>, Nils Bohmer<sup>3</sup>, Vasile-Dan Hodoroaba<sup>2</sup>

<sup>1</sup>Biotechnical Faculty, University of Ljubljana, Jamnikarjeva 101, Ljubljana, Slovenia

<sup>2</sup>Federal Institute for Materials Research and Testing (BAM), Division 6.1 Surface Analysis and Interfacial Chemistry, 12200 Berlin, Germany

<sup>3</sup>Society for Chemical Engineering and Biotechnology (DECHEMA), Theodor-Heuss-Allee 25, 60486 Frankfurt am Main, Germany

Nanomaterials bring various benefits and have become a part of our daily lives. However, the risks emerging from nanotechnology need to be minimized and controlled at the regulatory level and therefore, there is a need for nanorisk governance.

One of the prerequisites for successful nanorisk governance is the availability of high-quality data on nanomaterials and their impact with the human body and the environment. In recent decades, a countless number of publications and studies on nanomaterials and their properties have been produced due to the fast development of nanotechnology. Despite such a vast amount of data and information, there are certain knowledge gaps hindering an efficient nanorisk governance process. Knowing the state of the available data and information is an important requirement for any decision maker in dealing with risks.

In the specific case of nanotechnology, where most of the risks are complex, ambiguous, and uncertain in nature, it is essential to obtain complete data and metadata, to fill knowledge gaps, and to transform the available knowledge into functional knowledge. This can become possible using a novel approach developed within the NANORIGO project (Grant agreement No. 814530) – the Knowledge Readiness Level (KaRL).

In analogy to NASA's Technology Readiness Levels (TRLs), we define KaRLs as a categorization system of data, information, and knowledge which enables transformation of data and information into functional knowledge for nanorisk governance. Our approach goes beyond the technical curation of data and metadata and involves quality and completeness filters, regulatory compliance requirements, nanorisk-related tools, and most importantly, human input (inclusion of all stakeholder groups). With the KaRL approach we also address key issues in nanotechnology such as societal and ethical concerns, circular economies and sustainability, the Green Deal, and the traceability of data, knowledge, and decisions.

[The KaRL approach could be used for nanorisk governance by a nanorisk governance council \(NRGC\), which is currently under development by three EU projects \(NANORIGO, GOV4NANO, and RISKGONE\).](#)



# NMBP-13 Projects Bring Risk Governance to the Table

Mark Morrison  
 Optimat  
 Mark.morrison@optimat.co.uk

## The NMBP-13 Triumvirate at ENF 21

EuroNanoForum this year was a completely online affair. The risk governance projects participated in an active manner via 4 posters, highlighting developments across the projects in data management (and how the projects' data can be used appropriately to enable risk governance and made accessible to others for their use), how the Framework of data and decision tools to guide risk governance is developing as a web-based platform, and the evolution of the Council as an independent and inclusive organisation to improve the understanding of nanotechnology risk governance issues and provide guidance to different stakeholders.

The stand also had a short presentation for visitors to view, that described the purpose of the projects and expected outcomes.

The joint project exhibition booth was available throughout ENF'21 and welcomed partners from other projects to discuss ongoing activities and ways in which different projects could collaborate on stakeholder engagement.

Materials are available to view here on the [Zenodo Nano Risk Governance Community](#)



## ACHEMA Pulse (June 16<sup>th</sup>, online – Germany)

The three projects organised an interactive 90-minutes session at ACHEMA Pulse, held online due to COVID. This is a biannual meeting of the international chemical processing industries and covers a range of topics from novel processing technologies to standards and regulations.

The session provided an introduction to why the projects had been funded and what they hoped to achieve, before explaining the purpose of the risk governance framework and the council, using real-life examples of rubber tyres and emerging smart nanomaterials to illustrate how both would work in practice. Mentimeter was used to poll the audience, to gain an understanding of who their concerns regarding the governance of nanotechnology.





## NMBP-14 NanoInformaTIX presents its first results

NanoInformaTIX has already entered in its third year, focusing on the development of a Sustainable Nanoinformatics Framework (SNF) platform for risk management of engineered nanomaterials (ENM) in industrial manufacturing. As activities are progressing in line with the program, the first results are ready to be shared with stakeholders, as well as with the other EU-funded projects striving to provide industry and regulators with nanoinformatics and risk management tools.



During the month of May, two main events have taken place:

The first one has been the **Stakeholder workshop** held on May 10<sup>th</sup>, 2021. The event, organized virtually, demonstrated the early version of the NanoInformaTIX data and modelling platform to risk assessors participating from industry, as well as modelers and researchers. The aim was not only to show the platform, but also to gather precious feedback to improve the platform's design, interfaces and functionality. Moreover, feedback from potential users was gathered using the Value Proposition Canvas, to ensure that the final project output is positioned around what the customer/user values and needs. Such investigation, here performed at early version of the platform, provided valuable insights for the next steps of development.

The platform was discussed with all project partners also during the second **Consortium Annual Meeting**, which was held on 25<sup>th</sup>-27<sup>th</sup> May 2021. The meeting was organized as a series of workshops with the aim of fostering the exchange of ideas and the networking among the partners on the main NanoInformaTIX themes: DATABASES, MODELING, (FATE) DOSE EFFECT, MODEL INTEGRATION, PLATFORM. One very special session was dedicated to the relevance of NanoInformaTIX activities in the fight against COVID-19, as well as other potential impacts such as in response to the European Green Deal.

The following day, May 27<sup>th</sup>, was entirely dedicated to **collaboration with other EU-funded projects**. The coordinator and WP leaders from the "brother project" NanoSolve-IT were present, for a discussion on main themes of collaboration with NanoInformaTIX. In this session, also the coordinators from the NMBP-13/14 projects Gov4Nano, NANORIGO and RISKGONE were present and had a chance to give important feedbacks from the governance point of view. Quote from this meeting: *"NanoInformaTIX is providing the tools for tomorrow"* Janeck J. Scott-Fordsmand, Aarhus University, Project Coordinator of NANORIGO - Establishing a Nanotechnology Risk Governance Framework.

As of today, the following research reports have been published by NanoInformaTIX:

- "Size-Specific, Dynamic, Probabilistic Material Flow Analysis of Titanium Dioxide Releases into the Environment" Yuanfang Zheng, Bernd Nowack. **Environmental Science & Technology**
- "From Nanoinformatics to Nanomaterials Risk Assessment and Governance" Iseult Lynch, Antreas Afantitis, Dario Greco, Maria Dusinska, Miguel A. Banares, Georgia Melagraki. **Editorial: Nanomaterials | Special Issue**
- "multiGSEA: A GSEA-based pathway enrichment analysis for multi-omics data" Sebastian Canzler, Jörg Hackermüller. **BMC Bioinformatics**
- "How thermal stability of ionic liquids leads to more efficient TiO<sub>2</sub>-based nanophotocatalysts: theoretical and experimental studies" Anna Rybińska-Fryca, Alicja Mikołajczyk, Justyna Łuczak, Marta Paszkiewicz-Gawron, manika Paszkiewicz, Adriana Zaleska-Medynska, Tomasz Puzyn. **Journal of Colloid and interface Science**
- "Epigenetic effects of (nano)materials in environmental species – Cu case study in Enchytraeus crypticus" Volume 136 (2020) 105447, Elsevier, January 2020 Rita C. Bicho, Dick Roelofs, Janine Mariën, Janeck J. Scott-Fordsmand, Mónica J.B. Amorim. **Environment International**

[Cntd →](#)



Cntd →

- “A Chemoinformatics Approach for Characterization of Hybrid Nanomaterials: Safer and Efficient Design Perspective” Mikolajczyk A., Sizochenko N., Mulkiwicz, E., Malankowska A., Rasulev B., Puzyn T. **Nanoscale**
- “Fostering EU-US Cooperation in Nanosafety”. NanoInformaTIX Project Coordinator wrote the Emerging Materials section Miguel Bañares, Harvard University (USA), 5-6 March 2019
- “Pulmonary toxicity of silver vapours, nanoparticles and fine dusts: A review” Niels Hadrup, Anoop K. Sharma, Katrin Loeschner, and Nicklas R. Jacobsen. **Regulatory Toxicology and Pharmacology**
- “Transcriptomics in Toxicogenomics, Part I: Experimental Design, Technologies, Publicly Available Data, Regulatory Aspects” Pia Anneli Sofia Kinaret, Angela Serra, Antonio Federico, Pekka Kohonen, Penny Nymark, Irene Liampa, My Kieu Ha, Jang-Sik Choi, Karolina Jagiello, Natasha Sanabri, Georgia Melagraki, Luca Cattelani, Michele Fratello, Haralambos Sarimveis, Antreas Afantitis, Tae-Hyun Yoon, Mary Gulumian, Roland Grafström, Tomasz Puzyn, Dario Greco. **Nanomaterials**
- “Your spreadsheets can be FAIR: a tool and FAIRification workflow for eNanoMapper database” Nikolay Kochev, Nina Jeliaskova, Vesselina Paskaleva, Gergana Tancheva, Luchesar Iliev, Peter Ritchie, Vedrin Jeliaskov. **Materials**
- “Multigenerational exposure to WCCo nanomaterials – epigenetics in the soil invertebrate Enchytraeus crypticus” Rita C. Bicho, Janeck J. Scott-Fordsmand, Mónica J.B. Amorim. **Nanomaterials**
- “Developing an epigenetics model species - from blastula to mature adult, life cycle methylation profile of Enchytraeus crypticus (Oligochaete)” Rita C. Bicho, Janeck J. Scott-Fordsmand, Mónica J.B. Amorim **Science of The Total Environment**
- “Nanocharacterization, Materials Modeling, and Research Integrity as Enablers of Sound Risk Assessment: Designing Responsible Nanotechnology” Ioannis Xiarchos, Athanasios K. Morozinis, Panagiotis Kavouras, Costas A. Charitidis. **Small**
- “Prediction of the Joint Toxicity of Multiple Engineered Nanoparticles: Integration of Classic Mixture Models and in Silico Methods” Fan Zhang, Zhuang Wang, Martina G. Vijver, Willie J.G.M. Peijnenburg. **Chemical Research in Toxicology**
- “Nano-QSAR modeling for ecosafe design of second generation TiO<sub>2</sub>-based nano-photocatalysts” Alicja Mikolajczyk, Agnieszka Gajewicz, Ewa Mulkiwicz, Bakhtiyor Rasulev, Martyna Marchelek, Magdalena Diak, Seishiro Hirano, Adriana Zaleska-Medynska and Tomasz Puzyn. **Environmental Science: Nano**
- “The effect of Ag, Au, Pt, Pd on the surface properties, photocatalytic activity and toxicity of multicomponent TiO<sub>2</sub>-based nanomaterials” Anna Malankowska, Alicja Mikolajczyk, Joanna Mędrzycka, Izabela Wysocka, Grzegorz Nowaczyk, Marcin Jarek, Tomasz Puzyn, Ewa Mulkiwicz. **Environmental Science: Nano**

## About NanoInformaTIX

NanoInformaTIX is developing a web-based Sustainable Nanoinformatics Framework (SNF) platform for risk management of engineered nanomaterials (ENM) in industrial manufacturing. The tool will be based on the significant amounts of data on physico-chemical and toxicological and ecotoxicological properties of ENM generated over the last decades, as well as new data coming from research.

The final aim is to provide efficient user-friendly interfaces to enhance accessibility and usability of the nanoinformatics models to industry, regulators, and civil society, thus supporting sustainable manufacturing of ENM-based products.



For more information about our project, visit [www.nanoinformatix.eu](http://www.nanoinformatix.eu)

This project has received funding from the European Union's Horizon 2020 research and innovation

## NMBP-14 NanoSolveIT makes freely available a library of critical characteristics for 69 engineered nanomaterials



### This is the fifth freely available application that the project delivers

The development of nanomaterials (NMs) is an evolving process that has offered benefits to a wide span of industries and at the same time it has revolutionized our everyday lives. Although numerous benefits of NMs have been identified over the years, the innovation potential of NMs is inhibited by concerns regarding their potential adverse effects. These can include toxic effects, following accumulation in different organs, as well as indirect effects from transport of co-pollutants. Concerns are also arising as risk assessment is lagging behind product development, mainly because current approaches to assessing exposure, hazard and risk are expensive and time-consuming, and frequently involve testing in animal models.

To address these challenges, the European Union H2020-funded project NanoSolveIT aspires to introduce a groundbreaking computer-based (*in silico*) Integrated Approach to Testing and Assessment (IATA) for the environmental health and safety of NMs, implemented through a decision support system packaged as both a stand-alone open software and via a Cloud platform.

Antreas Afantitis, NanoSolveIT Project Coordinator says that “in the last 2 years the project has already presented some very impressive results with more than 30 publications, making the project one of the most active in the NMs space.”

One of the project’s latest achievements is a freely available cloud application that aims to enrich our knowledge of NMs properties and the link from property to effect, by providing a library that contains the full physicochemical characterisation of 69 NMs supplemented with calculated molecular descriptors to increase the value of the available information. The enriched dataset contains >70 descriptors per NM, and was used to develop an *in silico* workflow to predict NM  $\zeta$ -potential (effective surface charge) based on a number of descriptors that can be used as part of a safe by design (SbD) approach for design and production of safer and more functional NMs.

As Prof. Iseult Lynch, NanoSolveIT Project deputy-Coordinator and NanoCommons project Coordinator, says “One of the limitations to the widespread application of *in silico* approaches is the lack of large quantities of high-quality data, or of data with adequate metadata that will allow dataset interoperability and their combination to create larger datasets.”

Making the library of calculated and experimental descriptors available to the community, along with the detailed description of how they were calculated (the metadata, presented in the emerging community standard format of a MODA template) is a key first step towards filling the data gap.

The read across predictive model has been made publicly and freely available as a webservice through the Horizon 2020 (H2020) NanoCommons project (<http://enaloscloud.novamechanics.com/nanocommons/mszeta/>) and via the H2020 NanoSolveIT Cloud Platform (<https://mszeta.cloud.nanosolveit.eu/>) to ensure accessibility to the community and interested stakeholders. In addition, the full data set, ready for further computational modeling, is available through NanoPharos database, as the project consortium supports the FAIR data principles (i.e., is committing to making its data Findable, Accessible, Interoperable and Re-usable).

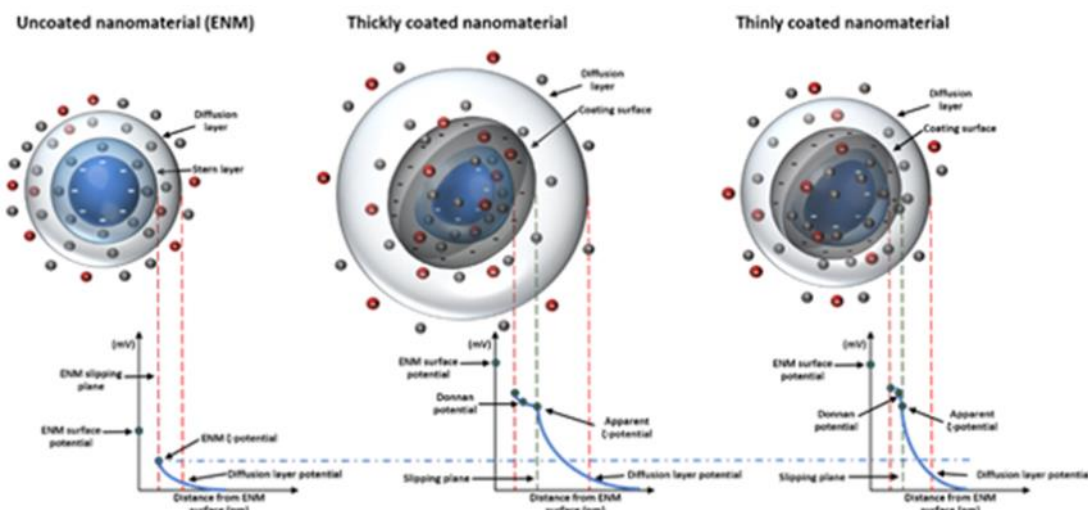


Figure (left) : Schematic representation of a negatively charged uncoated (left), a negatively charged thickly polymer-coated (middle) and negatively charged thinly polymer-coated (right) ENM

## NMBP-14 Open toxicogenomic data project improves our knowledge for nanomaterials toxicity



Nanomaterials are part of our everyday life but we are still at the very first steps of understanding the ways they interact with live organisms, including animals and humans. Toxicogenomics is a relatively new method that helps us to gain insight into the possible toxicity mechanisms of engineered nanomaterials (ENMs).

A team of scientists involved in NanoSolveIT, an EU nanoinformatics project funded under Horizon 2020, completed a study that was published in Nature journal Scientific Data (<https://www.nature.com/articles/s41597-021-00808-y>), in order to unleash the full potential of already existing transcriptomics data on ENM exposures. “While large amounts of transcriptomics data from ENM exposures have already been accumulated, a unified, easily accessible and reusable collection of transcriptomics data for ENMs was lacking” says Antreas Afantitis, NanoSolveIT Project Coordinator “The team manually curated, and preprocessed and unified a collection of 101 data sets, covering a range of ENMs, organisms, and exposure setups.”

As Professor Dario Greco, Director of the Finnish Hub for Development and Validation of Integrated Approaches, at Tampere University, says: “In an attempt to improve the FAIRness of already existing transcriptomics data for ENMs, we curated a collection of homogenized transcriptomics data from human, mouse and rat ENM exposures *in vitro* and *in vivo* including extracting the physicochemical characteristics of the ENMs used in each study from the associated publications.”

The traditional methods of toxicology, used for decades now to scrutinize the safety levels of engineered materials, provide us with a useful tool. However the successful marriage of computer technology and bioinformatics has given birth to a new generation of Toxicogenomics (TGx) tools. Their main function is to collect and store data sets which are further explored and used as the basis for development of predictive models.

The application of TGx data to nanosafety can provide novel possibilities for grouping and classifying ENMs based on the similarity of molecular alterations in biological systems they induce, and help to derive biomarkers to identify nano-specific signatures.

Transcriptomics technologies, used to study an organism as the sum of its RNA transcripts (known as the transcriptome), are the frontline of TGx. While large amounts of transcriptomics data for multiple ENMs have already been generated, offering a valuable resource for future studies and applications, the data are scattered across public repositories, and their FAIRness is currently hampered by their heterogeneous nature and a lack of standardization in the preprocessing and analysis.

The nanoPharos database (<https://db.nanopharos.eu/>), where all the datasets generated within the H2020 NanoSolveIT (<https://www.nanosolveit.eu>) and NanoCommons (<https://nanocommons.eu/>) projects are available, assists accessibility, interoperability and reusability of curated datasets.

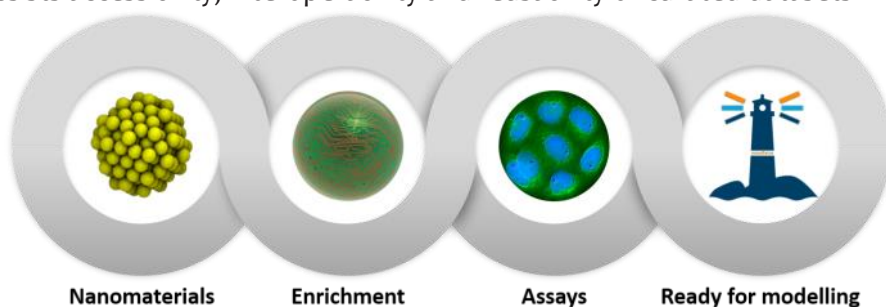


Figure 1: The nanoPharos database concept provides the users with structured, harmonised and ready for modelling datasets.

Antreas Afantitis, from NovaMechanics Ltd and NanoSolveIT H2020 project coordinator, commented: “nanoPharos database has been designed under the FAIR data principles to include computationally derived data based on simulations of ENMs at different levels of complexity. The database was further extended to include ENM characterization data and biological effects to support complete *in silico* nanosafety evaluation.”



## NMBP-15 The ASINA Project presents the Early Career Researchers Group



Sara Attanà

European Funding Development Dissemination Specialist

[sara.attana@warrantHub.it](mailto:sara.attana@warrantHub.it)

The ASINA project is pleased to introduce the newly-founded **Early Career Researchers group** (ECRs Group).

The ASINA project team is composed of 19 partners, from academic and industry, with a big number of young researchers and professionals: this is the reason why ASINA decided to create a group dedicated to them.

The ECRs group is led by **Ilaria Zanoni**, Postdoctoral Researcher at ISTECCNR, and **Stefania Melandri**, Project Manager at the Business Unit European Funding Development of Warrant Hub; the group is composed of 18 young scientists from 7 partner organizations of 5 EU countries. The group will meet every two months, to share their experience from the project and to update each other about activities and events of interest. The main tasks will be the organization of training events, focus groups on SbD approach with the collaboration of other projects and the delivery of a six-month newsletter to give updates about the group's news. It's possible to sign up to the newsletter on the ECR group webpage on the ASINA project website.

The group was born from ASINA but it is open to the participation of young researchers from other projects in the safe-by-design field. The objective is to create a huge inter-projects ECRs group with NMBP-15 and NMBP-16 projects.

For more info, visit the Early Career Researchers webpage:

<https://www.asina-project.eu/early-career-researchers/>



## NMBP-15 SABYDOMA: Videos showing the first developments of SABYDOMA's technology



Beatriz Alfaro Serrano

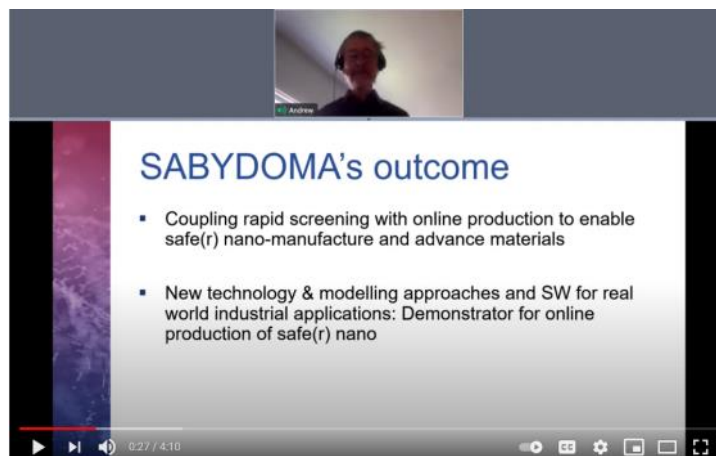
[beatriz.alfaro@bnn.at](mailto:beatriz.alfaro@bnn.at)

BioNanoNet Forschungsgesellschaft mbH (BNN)

A number of short videos have been put together by SABYDOMA Partners with the aim of showing current technological developments within the project:

- [SABYDOMA's pitch video](#)

Presented by Andrew Nelson, Project Coordinator, this is a short video giving an overview of the EU H2020 project SABYDOMA.



- [Development of the SABYDOMA "bio-membrane" sensor and "mini-release accelerator"](#)

William Stokes, a researcher from [UNIVLEEDS](#), explains how a nano-material production line is coupled to a bio-membrane screening platform to demonstrate 'in-line' screening. The video describes how the bio-membrane sensor is being developed, how it is intended to perform and how it is integrated into the screening platform. It also shows how the coupling to continuous-flow production systems will be delivered.

- [Key findings on the Legal Aspects of SbD](#)

Anthony Bochon, from [G&S](#), talks about the key findings of the [1st legal workshop on SbD](#) organised by SABYDOMA on 28th January 2021, where together with international lawyers and scientists, SABYDOMA explored potential definitions of SbD approaches from the legal perspective.

- [Development of a Regulatory Sandbox for Nanomaterials](#)

Ignasi Gispert Pi, from [APPNPS](#), talks about SABYDOMA's aim of developing a Regulatory Sandbox for Nanomaterials underpinned by Safe- & Sustainability-by-Design (SSbD) methodologies and strategies taking advantage of Computational Models based on Artificial Intelligence (AI). This will offer opportunities to explore and test a regulatory framework capable of delivering effective and efficient oversight of nanomaterials while promoting nano-innovations.

- [SABYDOMA's 'In-line' Toxicity Screening of Nanomaterials](#)

Thorsten Knoll, from [Fraunhofer IBMT](#), explains how the SABYDOMA project is developing 'In-line' Toxicity Screening of Nanomaterials, where *in vitro* toxicity testing procedures are aligned with on-line production process of nanomaterials to enable safer manufacturing of nanomaterials.



SABYDOMA project has received funding from the European Union's HORIZON 2020 Research & Innovation Programme under grant agreement no. 862296.

## NMBP-15 SbD4Nano— General Assembly Meeting

SbD4Nano partners show great progress during their 1st annual meeting



Dr Stella Stoycheva  
SbD4Nano Project Communication  
Yordas Group  
[s.stoycheva@yordasgroup.com](mailto:s.stoycheva@yordasgroup.com)

On 19-20 May the SbD4Nano project successfully held their Annual Consortium Meeting virtually. The project partners presented an overview of the results obtained during the last 12 months.

Key objective of the project is the development of an e-infrastructure to foster dialogue and collaboration between actors along the nanotechnology supply chain for a knowledge-driven definition of Safe-by-Design approaches based on hazard, exposure, product performance and cost criteria. During the meeting the draft design of the platform was presented followed by a discussion of the provisioned modules of the platform including materials, life cycle assessment, release & exposure estimation, safety and hazard profiling and SbD strategy modules.

Interactive discussions with industrial partners allowed the consortium to confirm and discuss key results from the recently completed SAbYNA & SbD4Nano Nanotechnology value chain needs survey.

SbD4Nano Project Coordinator, Carlos Fito says:

*“The project developments over the last year have exceeded my expectations. In future SbD4nano is expected to make a significant impact for the safe manufacturing and use of ENMs via its e-infrastructure. We look forward to sharing it with stakeholders.”*



### The SbD4Nano Videos

The SbD4Nano project contributed with a video pitch to the EuroNanoForum 2021.

The video is available to watch on the NSC [YouTube](#) channel.

Want to learn what SbD4Nano is about in 3 minutes? Watch our [Video](#)!

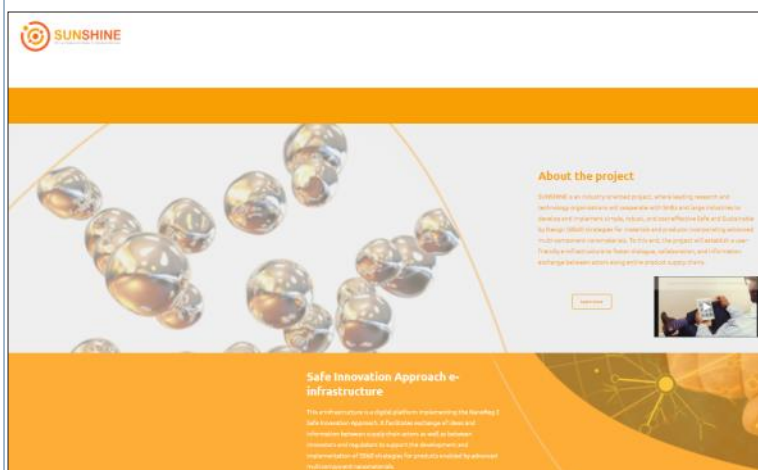
## NMBP-16 SUNSHINE Goes Live!

The H2020 SUNSHINE project is pleased to announce the launch of its website



In the past couple of months, we have worked hard to create a visual identity for our project that reflects who we are and how we do science. And now we are happy to share it with you!

The Horizon 2020 SUNSHINE project is developing and implementing simple, robust, and cost-effective Safe and Sustainable by Design strategies for materials and products incorporating advanced multi-component nanomaterials.



The website will be the main communication platform of the SUNSHINE project and will provide one-stop access to project information and updates, as well as results from cutting-edge science, definitions and concepts related to the project scope.

You can visit the SUNSHINE project website here: <https://www.h2020sunshine.eu/>

A first short SUNSHINE project video has been created and is available to watch on the project website and on YouTube.

### News from the SUNSHINE Kick Off Meeting

The first General Assembly of the project took place on February 16th to 17th in a virtual platform to gather consortium partners across the globe in a collaborative discussion on how the project goals would be achieved and what actions will be taken throughout the project.

Read more [in our Press Release](#).

### Project Facts:

Project Reference 952924

Duration 48 months, starting in January 2021

Total Budget 8M €

SUNSHINE is an industry-oriented project, where leading research and technology organisations will cooperate with SMEs and large industries to develop and implement simple, robust, and cost-effective Safe and Sustainable by Design (SSbD) strategies for materials and products incorporating advanced multi-component nanomaterials. To this end, the project will establish a user-friendly e-infrastructure to foster dialogue, collaboration, and information exchange between actors along entire product supply chains.

### Contacts for Press:

Dr Stella Stoycheva  
Stakeholder Engagement and Dissemination Manager  
Yordas Group  
[s.stoycheva@yordasgroup.com](mailto:s.stoycheva@yordasgroup.com)

Besa Maliqi Sylva  
Dissemination Manager  
Yordas Group  
[b.maliqisylva@yordasgroup.com](mailto:b.maliqisylva@yordasgroup.com)

## NMBP-16 H2020 DIAGONAL Spotlight

### EU H2020 PROJECT DIAGONAL Development and scaled Implementation of sAfe by design tools and Guidelines for multicOmponent aNd hArn nanomaterials DIAGONAL

On May 4th, 2021, the brand new H2020 EU project DIAGONAL officially kicked-off.

High-level experts from 22 international organisations committed to collaborate for a period of 42 months, with a total project budget of more than € 6 million.



The newly funded research and innovation action addresses nanosafety issues of the next generation of nanomaterials, such as complex mixtures and multicomponent materials, and how to expand the Safe-by-Design concept towards sustainability to allow not only safe but also sustainable nanotechnology applications.

DIAGONAL aims to bring Safe-by-Design knowledge and tools to a development stage which can be implemented in the multicomponent nanomaterials (MCNMs) and high aspect ratio nanomaterials (HARNs) related industries, relying on experimental (in-vitro) and modelling (in-silico) research, to study specific hazard and exposure properties that MCNMs & HARNs exhibit along their life cycle, with emphasis in the interactions between nanomaterial constituents, with other particles and the environment, as well as their release rate and fate.

While hazard and exposure determination will allow gaining understanding on the MCNMs & HARNs behavior and evolution, multi-scale modelling will answer the questions “what are they?” and “where do they go?”, through novel predictors for properties estimation, resulting from additive and/or synergistic interactions between components, as well as system-dependent properties.

Ultimately, the obtained results will serve as basis to provide adapted or novel risk management guidelines, ready to use Safe-by-Design tools and strategies to increase nanomaterials safety, including Sustainable-by-Design considerations, and recommendations for risk governance. 7 industrial cases producing or using MCNMs/ HARNs will participate providing data from scaled up scenarios, validating models, and implementing the novel Safe-by-Design approaches and tools developed in the project.

Exploitation activities and connection with Open Innovation Test Beds will allow mainstreaming Safe-by-Design among targeted industries. DIAGONAL partners are involved in current R&D projects (e.g., NMBP-12-2017, NMBP-13-2018, NMBP-14-2018, NMBP-15-2019), networks (e.g., NanoSafety Cluster and EMMC) and working groups (e.g., OECD - WPMN and BNCT).

The project will establish cooperation lines with the US nanosafety research community involving a US partner and integrating renowned US institutions on its advisory board, guaranteeing resource-efficient working plans, aligned with current EU and international efforts in the nanosafety field, and facilitating the use of existing reference platforms and databases

Contact ICCRAM – UNIVERSIDAD DE BURGOS, Spain

Juan Antonia TAMAYO RAMOS [jatramos@ubu.es](mailto:jatramos@ubu.es)

[www.ubu.es/iccram](http://www.ubu.es/iccram)

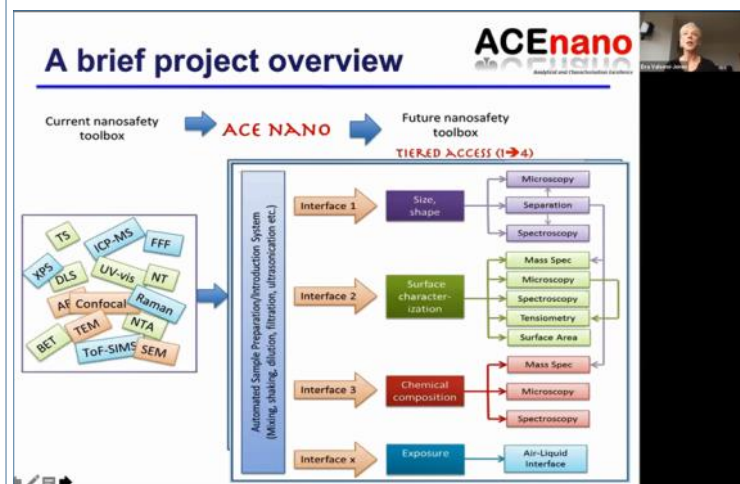
<https://twitter.com/DIAGONALproject>

## ACEnano holds its final stakeholder event

By Stephen Lofts (CEH, UK)



The ACEnano H2020 project held its final stakeholder event on 21<sup>st</sup> June 2021. This 4-year project (extended to 4.5 years due to the COVID-19 pandemic) has worked to develop analytical techniques for the characterisation of nanomaterials for risk assessment. The project has developed analytical knowledge at three levels: (i) innovation in new techniques; (ii) refinement of existing techniques; (iii) benchmarking, performance assessment and standardisation of established techniques.



The project has developed a range of tools to help users through the process of selecting techniques for their needs. These include a decision tool for technique selection (based on the NanoDefiner e-tool) and a Knowledge Infrastructure for storage and retrieval of Standard Operating Procedures, performance data from interlaboratory comparisons, and links to video protocols for selected techniques.

presented, and to facilitate discussion on how the project outcomes could usefully be used by the nanosafety community and further developed in future projects.

The presentations provided were:

- Project overview (Eva Valsami-Jones, Coordinator, University of Birmingham);
- Analytical method development (Frank von der Kammer, Vienna University);
- Method benchmarking and interlaboratory comparisons (Stephen Lofts, UK Centre for Ecology and Hydrology);
- The ACEnano Toolbox (Decision Tool and Knowledge Warehouse) (Ruud Peters, Wageningen Food Safety Research) and Barry Hardy, Edelweiss Connect);
- Standardisation activities in ACEnano (Jörg Radnik, Federal Institute for Materials Research and Testing)

Additionally, two members of the ACEnano consortium presented special ‘Highlights’ of the analytical development work done within the project:

- Florian Meier (Postnova): Automated and reproducible preparation of nanoparticle suspensions using the SP2000 NOVAPREP – Nano Particle Sample Preparator;
- Andy Chetwynd (University of Birmingham): An Untargeted TGA-FTIR-GCMS Approach for Plastic Polymer Identification

The event was attended by stakeholders from academia, regulation and industry. Stakeholders generally considered that the project had achieved its stated objectives and that the developed tools were of potential use for stakeholders with interests in nanomaterial analysis for academic, regulatory and risk assessment purposes. Stakeholders emphasised the need to disseminate the project outcomes to increase their usefulness in related areas such as the development of robust standards and guidelines for nanomaterial characterisation, including grouping and read-across approaches in nanotoxicology. Considering future developments, stakeholders emphasised the need for analytical development to focus on robust characterisation of nanomaterials in media such as consumer products and the natural environment.



## NanoCommons: The MIE prediction tool webinar



On **Tuesday, 18th May 2021**, the H2020 project [NanoCommons](#), in a joint initiative with the [NanoSafety Cluster](#), offered an online webinar on the use of their **Molecular Initiating Event (MIE) Prediction Tool** accessible via the NanoCommons Knowledge Base (NC KB).

**Introduction and Host:** [Martin Himly](#), PLUS and Chair of NanoSafety Cluster WG-A on Education, Training, and Communication

**Webinar Speaker:** [Abhijit Dasgupta](#), UCD

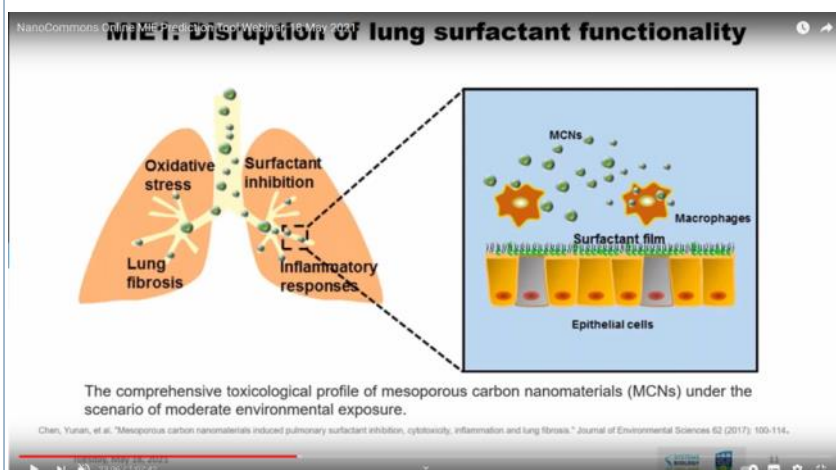
**Panel for Q+A session:** [Vadim Zhernovkov](#) and [Vladimir Lobaskin](#), UCD

Toxicity testing and regulation of advanced materials at the nanoscale *i.e.*, nanosafety, is challenged by the growing number of nanomaterials. The existing animal-reliant toxicity testing tools are onerous in terms of time and resources. There is a need for faster, cheaper, sensitive and effective animal alternatives that are supported by mechanistic evidence. Moreover, there is an urgency for developing alternative testing strategies. The Adverse Outcome Pathway (AOP)-based approaches provide pragmatic insights to promote the development of alternative testing strategies. MIE is the first step in an AOP and can be considered as a chemical interaction between a chemical toxicant and a biological molecule. Key chemical characteristics can be identified and used to model the chemistry of these MIEs. Predicting actual MIEs without time-resolved data establishing the MIE is challenging. Risk assessment requires information on the exposure conditions (e.g., route, dose, duration and frequency) needed to cause an AO.

The NanoCommons MIE gene set database (NanoCommons GS-MIE DB) captures:

- Gene signatures (GS) of MIEs by integrating knowledge from KEGG, REACTOME, GO, WikiPathways public databases;
- Custom gene sets from published data;
- To date, manual collection of 132 gene sets representing three different types of MIE actions:
  - MIE1. Disruption of lung surfactant functionality
  - MIE2. Lysosomal destabilization
  - MIE3. Oxidation of cell membrane

The webinar started with a short *introduction to NanoCommons*, as a nanosafety data and knowledge infrastructure, given by [Martin Himly](#), Chair of the [WG-A “Education, Training and Communication” of the NSC](#), followed by an introduction to the webinar topic highlighting the already existing AOP-related webinar materials that have been offered in the past. All available training materials provide further background and insight. Concretely, , the previous AOP-related webinars, such as the [SmartNanoTox final meeting](#), session 1 at the [NSC Education Day](#), and the [Online AOP-Wiki Webinar](#) were mentioned.



Following Martin’s introduction, [Abhijit Dasgupta](#), from UCD, reviewed the AOP concept and elaborated on the challenges of modeling MIEs for the case of nanomaterials. He explained the above-mentioned MIEs relevant for different nanoparticle types (right: screenshot for MIE1). Later during the webinar, Abhijit went through the background of the underlying data sets and

[Cntd →](#)

**Cntd** → the mathematical models behind the prediction tool. Towards the end of the webinar, he showcased the prediction tool running a few query applications, giving insight in the tool performance.

It was a well-attended webinar, with interested participants, who communicated their appreciation at the end of the webinar during an extensive Q&A session, where [Vadim Zhernovkov](#), who was involved in the development of the tool, provided further details and insights. The webinar presentation slides and the recording (recorded for educational purposes) are available in the [NanoCommons Infrastructure](#), in [Zenodo](#), [YouTube](#) and in the [NanoCommons' Elixir TeSS channel](#).

NanoCommons Online MIE Prediction Tool Webinar, 18 May 2021

# MIE Prediction Tool Webinar

**Intro on Education within the EU NSC**

- ▶ NanoCommons Knowledge Infrastructure
- ▶ Available material on AOP-related topics
- ▶ What's next?

**MIE Prediction Tool**

- ▶ Webinar by Abhijit

**Take home**

- ▶ Q&A

**Martin Himly (PLUS)**  
Chair WG-A Education,  
Training, Communication  
[www.nanosafetycluster.eu](http://www.nanosafetycluster.eu)

*NanoCommons Webinar, 2021-05-18, #nanocommons*  
by **Abhijit Dasgupta, University College Dublin, IE**

*This project has received funding from the European Union Horizon 2020 Programme (H2020) under grant agreement no. 731032.*

CC-BY-4.0 International

**Beatriz Alfaro Serrano** (BNN, Graz, AT, [beatriz.alfaro@bnn.at](mailto:beatriz.alfaro@bnn.at)) leads the NanoCommons work package on *Integration & Sustainability*. **Martin Himly** (PLUS, Salzburg, AT, [martin.himly@sbg.ac.at](mailto:martin.himly@sbg.ac.at)) takes care of all *Training* issues within NanoCommons and is the chair of the *EU NanoSafety Cluster - Work Group A on Education, Training, and Communication*.





NanoCommons  
Nano-Knowledge Community



## Online QSAR Modelling Hackathon by Easy Access to Jaqpot: Deploy your model as a web service in a few minutes

On **Tuesday 13th April 2021**, the H2020 project [NanoCommons](#), in a joint initiative with the [NanoSafety Cluster](#) (NSC) and supported by the developments in the H2020 project [NanoSolveIT](#), organized an *online webinar* on “**Online QSAR Modelling Hackathon by Easy Access to Jaqpot**”. The National Technical University of Athens team (NTUA), Haralambos Sarimveis and Philip Doganis, offered an entry-level workshop on *in silico* nanotoxicology, providing users with easy (no installations required) access to Jaqpot, a powerful and versatile nanotoxicological *in silico* prediction platform, enabled through powerful Google Colab notebooks.

Under the title “**Deploy your model as a web service in a few minutes**”, more than 30 participants from a mixed audience (academia, research organisations, industry, regulators, etc.) learned how to develop a Quantitative Structure-Activity Relationship (QSAR) model and to publish it as a web application through the Jaqpot platform with minimal programming skills requirements. The participants also learned that models built on Jaqpot can be used over the graphical user interface or across platforms over the API and that they can be shared to groups with controlled access and rights.

The webinar started with a short *introduction* to NanoCommons, given by [Martin Himly](#), Chair of the [WG-A “Education, Training and Communication” of the NSC](#), on the brand new [NanoCommons User Guidance Handbook](#), explaining also where to find the different training materials offered by NanoCommons, and the forthcoming events being organised by NanoCommons. There was also a special mention to the upcoming [Targeted TA Call supporting the integration of NanoSafety Tools into the NanoCommons Knowledge Infrastructure](#).

Following Martin’s intro, Haralambos Sarmveis, from NTUA, gave an *introduction* to *QSAR Predictive Modelling on Jaqpot*.

After that, his colleague Philip Doganis, from NTUA, guided the audience through the training on *Jaqpot easy-accessed by Google Colab Notebooks*.

To support the workshop participants through the hands-on training, two *break-out* rooms were set up and supervised by the NTUA team (Periklis Tsiros, Pantelis Karatzas and Jason Sotiropoulos).

Cntd →

Cntd →

The screenshot shows a webinar interface. On the left, a Jupyter notebook titled 'Fullerene Solubility model April2021.ipynb' is open. The notebook content includes the title 'Online QSAR Modelling Hackathon by Easy Access to Japqot: Deploy your model as a web service in a few minutes' and a section '1. Setting up packages' with the following code:

```
! pip install japqotpy
```

The output shows the installation progress for 'japqotpy' and its dependencies: 'requests', 'pandas', and 'pydantic'.

On the right, a presentation slide with the NanoCommons logo is displayed. The slide title is 'Online QSAR Modelling Hackathon by Easy Access to Japqot: Deploy your model as a web service in a few minutes'. Below the title, it says 'Tue, Apr 13, 2021 3:00-4:30 PM CEST'. A 'Briefly' section contains the following bullet points:

- You will learn how a local QSAR model can be transformed to an online QSAR model web service, no installations required
- Prerequisites:
  - For access to japqot, you will need a japqot account
  - For access to Google colab you will need a Google account

The webinar was well-attended and engaged a number of highly interested participants who expressed their appreciation at the end for the opportunity to interact as well as skill up.

The webinar presentation slides and the recording (recorded for educational purposes) are available in the [NanoCommons Infrastructure](#), in [Zenodo](#), [YouTube](#) and in the [NanoCommons' Elixir TeSS channel](#).

**Beatriz Alfaro Serrano** (BNN, Graz, AT, [beatriz.alfaro@bnn.at](mailto:beatriz.alfaro@bnn.at)) leads the NanoCommons work package on *Integration & Sustainability*. **Martin Himly** (PLUS, Salzburg, AT, [martin.himly@sbg.ac.at](mailto:martin.himly@sbg.ac.at)) takes care of all *Training* issues within NanoCommons and is the chair of the *EU NanoSafety Cluster - Work Group A on Education, Training, and Communication*.

### What is NanoCommons

Read-across approaches, which are currently absent for NMs, in large part as a result of data fragmentation and inaccessibility, would reduce the cost of nanosafety research and regulation dramatically by removing the need for extensive laboratory and animal testing.

The availability of a nanosafety knowledge infrastructure, that organises and visualises data and data relationships, makes it accessible, integrates computational tools for risk assessment and decision support, enables their validation and facilitates the necessary grouping will be a critical factor in reducing regulatory costs.

The H2020 Infrastructures project, NanoCommons, addresses this gap by creating a community framework and infrastructure for reproducible science, and in particular for *in silico* workflows for nanomaterials safety assessment and beyond, by:

1. integration and federation of existing NMs characterisation and interaction mechanisms knowledge, protocols and data (beyond simple toxicity), along with quality assurance criteria and underpinning ontologies
2. compilation and development of a user-friendly interface for a suite of computational tools for mechanistic and statistical modelling, read-across, grouping, safe-by-design and life cycle assessment, and bench-marking of their predictive power; and
3. provision of (typically remote) access to its Knowledge Base, modelling toolbox (predictive, grouping, risk assessment) and workflow optimisation, and the supporting expertise, to the broader user community

## ‘Identification and solving barriers for translating science to regulation’ NanoHarmony webinar attracts over 280 registrants

Nikolina Latkovic

Communications and Project Officer,  
Nanotechnology Industries Association  
[nikolina.latkovic@nanotechia.org](mailto:nikolina.latkovic@nanotechia.org)

# NanoHarmony



Over 280 registrations were received for NanoHarmony’s webinar ‘Identification and solving barriers for translating science to regulation,’ held on March 17th.

This webinar focused on helping identify the gaps and obstacles faced by stakeholders in developing new test methods and having them introduced as new test guidelines and guidance documents—covering the full journey from science through to use in regulations.



Stakeholders had the opportunity to provide their experiences during the workshop and these are crucial in helping to develop a new framework that will help smooth the transition of knowledge from science to guidance.

[The webinar recording is now available online.](#)

The webinar agenda can be found below with the presentation slides linked to the title of their respective sessions.

- Claus Svendsen, CEH Welcome and introduction [SLIDES](#)
- Eric Bleeker, RIVM- The OECD process: From knowledge generation to embedding in a test guideline or guidance document [SLIDES](#)
- Lya Hernandez, RIVM How knowledge flows can address the knowledge needs of regulators [SLIDES](#)
- Susan Wijnhoven, RIVM What do risk assessors want and need? The results of a transdisciplinary summit [SLIDES](#)
- Adriëne Sips, RIVM Developing regulatory readiness levels to address barriers and aid the flow of knowledge: Stakeholder feedback and discussion [SLIDES](#)
- Claus Svendsen, CEH Close and next steps [SLIDES](#)

### Help develop our guidance—contribute to stakeholder input—complete our survey!

The H2020 funded NanoHarmony project is looking for people to share their experiences with OECD test guidelines and guidance documents to help it develop more efficient processes for their future development.

All stakeholders can help by [completing a short survey](#), which will allow the project to map best practice.

Please do spare the time to help develop guidance to help the better translation of scientific development into suitable regulatory tools.

## NanoHarmony hosts workshop: ‘Learning lessons from the past – and knowing what your customer needs’

This NanoHarmony workshop followed the journey of a Guidance Document (GD) or Test Guideline (TG) through the OECD process from the standard project submission form (SPSF), through to its adoption and use. At each stage of the process the ‘audience’ changed and therefore so did the information requirements needed to be able to address their ‘needs’.



The aim of the workshop was to highlight the changes in emphasis and information required at each of the TG/GD process steps and to allow delegates to share their experiences at different stages of the TG/GD process.

The workshop provided a greater shared understanding of how future OECD TG/GD can more efficiently navigate the acceptance process to help build guidance for future proposers based on best practice.

The workshop was aimed at all stakeholders interested in the TG/GD process including:

- Scientists- who may be interested in having their innovation taken forward into a test guideline
- OECD Expert- who can provide their experiences of managing the OECD TG/GD process
- Regulators- who administer the key regulatory frameworks that industry needs to comply with
- Policymakers- who set the overall chemicals legislative framework either nationally or globally through the EU or OECD
- Industry- who are looking for test guidelines to allow them to meet their regulatory obligations

The interaction between different stakeholders allowed NanoHarmony to learn from previous experiences with the TG/GD process, establish best practice from learned experiences, and to summarise this into good practice guidelines.

### Follow NanoHarmony and get involved

Interested stakeholders can sign up to follow NanoHarmony through the [project newsletter](#) and get involved through the webinars and events scheduled through the project.

### About NanoHarmony (grant number 885931):

The NanoHarmony project, funded through Horizon 2020, has the mission to support the development of Test Guidelines (TG) and Guidance Documents (GD) for eight substances where nanomaterial-adapted test methods have been identified as an industrial priority. NanoHarmony will coordinate the collection and use of available data and information to support the finalisation of the test method development and to organise a sustainable network for the needed exchange, also for future regulatory development needs.

Visit [www.nanoharmony.eu](http://www.nanoharmony.eu)

## NanoExplore—news and updates

### Integrated approach for exposure and health effects monitoring of engineered nanomaterials in workplaces and urban areas

[www.lifenanoexplore.eu](http://www.lifenanoexplore.eu)



NanoExplore uses an integrated approach containing biomonitoring studies and the characterisation of exposure levels of engineered nanomaterials (ENM) in indoor workplaces and urban areas. Data of ENMs concentrations, measured by a wireless sensor network, appropriate biomarkers and a web-based data management tool will help to minimise possible effects of ENMs to human health.

The last couple of months brought some excellent results with several publications coming out. Read the latest NanoExplore publications and discover the project progress below:

- [Evaluation of potential engineered nanomaterials impacts on human health: from risk for workers to impact on consumers](#)
- [Producers of Engineered Nanomaterials—What Motivates Company and Worker Participation in Biomonitoring Programs?](#)
- [Reference Ranges of 8-Isoprostane Concentrations in Exhaled Breath Condensate \(EBC\): A Systematic Review and Meta-Analysis .](#)
- [Urinary 8-OHdG as a Biomarker for Oxidative Stress: A Systematic Literature Review and Meta-Analysis](#)

### In other NanoExplore news:

- An OPEA experimental study has been launched. Recruitment and data collection are ongoing by the SHeS-pp research team; the Provisional deadline for data statistical analyses and report is by the end of 2021.
- COVID really made it difficult to conduct studies on site, but, despite that, field campaigns, for the “exposed” and “internal control” groups in companies, are planned for May-June (Italy), June-July (Spain) and October-November (Switzerland). All partners involved are working hard towards companies recruitment and campaign organisation.
- A Pilot study has been held in a factory close to Turin where TiO<sub>2</sub> is used for paints and varnishes.
- Members of the NanoExplore team participated in NanoTox Conference 20th - 22nd April 2021. They presented posters about ‘A biomonitoring pilot study in workers exposed to pigment-grade titanium dioxide (TiO<sub>2</sub>) during paints production’ and ‘NanoExplore – A pilot study to demonstrate the feasibility of a harmonized approach for monitoring exposure to engineered and incidental nanoparticles and their potential health effects’.

#### Project Coordination:

ALCON Consultant Engineers Ltd  
Athens, Greece  
Email: [ap@axonenviro.gr](mailto:ap@axonenviro.gr)

#### Dissemination:

Yordas Group  
Forchheim, Germany; Lancaster, UK  
Email: [j.friesl@yordasgroup.com](mailto:j.friesl@yordasgroup.com)

## PATROLS holds successful workshop on advances in nanomaterial human and environmental hazard assessment methods



**PATROLS**  
Advanced Tools for NanoSafety Testing

Nikolina Latkovic  
Communications and Project Officer  
Nanotechnology Industries Association  
[nikolina.latkovic@nanotechia.org](mailto:nikolina.latkovic@nanotechia.org)

As one of its final dissemination activities, PATROLS held a stakeholder workshop to showcase the tools and advanced methods that have been developed within the project. The workshop highlighted the nanomaterial characterisation in biological systems and *in silico* hazard models and the advanced *in vitro* human tissue models and ecotoxicity testing systems that the project has developed and to help stakeholders from industry, regulatory bodies and policy makers understand how they can access and use these methods and tools in their work.



PATROLS has been working to help deliver better models and test methods that can be used to help address concerns over the use of animals in chemical testing and to provide quicker and efficient tests that are accessible for use in industry. The project is well positioned to help deliver some of the key components of the European Commission's chemicals strategy for sustainability and project outcomes will be able to address some of the key components to deliver safe and sustainable chemicals. The workshop was an opportunity for stakeholders to understand the key developments that have been achieved within PATROLS, to be guided through some of the models, tools and methods that have been developed within the project and how these can be accessed by stakeholders for their own use.

The workshop welcomed 122 attendees from 25 different countries

### PATROLS - Physiologically Anchored Tools for Realistic nanOmateriAL hazard aSsessment

PATROLS is an international project combining a team of academics, industrial scientists, government officials and risk assessors to deliver advanced and realistic tools and methods for nanomaterial safety assessment. PATROLS will provide an innovative and effective set of laboratory techniques and computational tools to more reliably predict potential human and environmental hazards resulting from engineered nanomaterial (ENM) exposures. These tools will minimise the necessity of animal testing and will support future categorisation of ENMs in order to support safety frameworks.

#### We aim to deliver:

1. Realistic and predictive 3D tissue models of the lung, gastrointestinal tract and liver for ENM safety assessment, reducing the need for animal testing.
2. Innovative methods for safety assessment in ecologically relevant test systems and organisms, selected according to their position in the food chain.
3. Creating robust computational methods for ENM exposure and dose modelling, as well as hazard prediction.
4. Characterising ENM under relevant experimental conditions dictated by the advanced human and environmental

[View the full agenda here.](#)

To catch up with PATROLS, [subscribe to our newsletter](#) as a project stakeholder.

[Follow the project on LinkedIn](#) for the latest news and opportunities.

## BIORIMA Project in its final year

Now in its final year, the BIORIMA Project has issued its 4th Newsletter

Rudolf Reuther  
Environmental Assessments  
[Rudolf.reuther@enas-online.com](mailto:Rudolf.reuther@enas-online.com)

A safe and sustainable society and environment are the two pillars on which our future stands, and both have to be continuously supported and protected by transparent, long-sighted and science-based regulation that is shared by all actors involved. BIORIMA is contributing to these ongoing new regulatory needs by developing novel methodologies that help us to obtain the knowledge and tools to manage possible risks associated with emerging new materials, such as nanobiomaterials (NBM), when used in medical applications. The project has developed an extensive amount of scientific data that will not only help us to prevent, control or mitigate possible adverse effects that these materials may cause, but also strengthen the in-house compliance of endusers, such as material manufacturers, users or service providers, with the rapidly changing regulatory environment. In this way, it will expedite the journey through the “dead valley” - the time between a new innovation and its market entry.

As the project is in its final year, a main focus of the work is still to integrate the vast amount of knowledge, data and methodologies generated during the past three years into the BIORIMA Risk Management Framework (RMF) and Decision Support System (DSS), which are the core results of the project.

These are the ‘go-to’ platforms for end-users to find the most appropriate measurement and testing tools, techniques and routes to handle the possible risks of nanobiomaterials along the product life cycle, in relation to expected benefits and as part of their registration and authorization protocols. Case studies have been performed to demonstrate the applicability of the RMF/DSS for particular NBM using local and remote validation exercises underpinned by industrial partners from within the consortium, and by consulting with stakeholders outside the project. Comprehensive regulatory-related technical, organizational and material relevant information was collected, evaluated and used to assess the performance of the tools developed in the project and integrated into the IRM framework.

Results from these surveys will help to ensure that NBM can be managed in a safe and sustainable way, and possible risks reduced or avoided when used in MD and AMTP. Finalization of the BIORIMA database and some complementary material measurement and testing is ongoing and will be combined with these validation studies in the final year to further refine and improve the RMF, to ensure that the current DSS prototype will be fit-for-purpose, most efficient, reliable, and user-friendly. Ultimately, it will enable end-users to successfully analyse and provide all the relevant information required by current regulation, such as REACH or the new EU MDR 2021.

To find out more about the BIORIMA Project, visit [www.biorima.eu](http://www.biorima.eu)

Also, [download the newsletter here](#)





## BIORIMA reports on NanoTox 2021—A virtual success showcasing the latest research and development in nanosafety research



The nanosafety community met virtually for the 10th International Conference on Nanotoxicology - NanoTox between 20th to 22nd April 2021. This year's conference was jointly organised by three leading EU Horizon 2020 Projects: BIORIMA, GRACIOUS, and PATROLS - focusing on the development of novel tools for evaluating human and environmental hazard, and strategies for nanomaterial characterization, grouping, and read-across for risk analysis.

The conference not only showed the outputs and results from three years of research from these three projects, but also showcased the latest trends and developments in the field of nanosafety. Topics included hazard characterisation and assessment, risk assessment and governance, release and exposure, alternative hazard testing methods as well as Safe(r) by design (SbD) of nanomaterials and advanced materials. "NanoTox2021 has been an opportunity to showcase three key interacting projects to the nanosafety community. Right from the start of these three projects we planned to facilitate this meeting and we are so pleased that it has been a huge success," remarked Vicki Stone, Project Coordinator of the GRACIOUS Project, Heriot-Watt University.

Overall, the conference welcomed 361 participants from 33 countries, who attended 82 oral presentations, 117 poster presentations and seven keynote presentations. Participants included representatives from academia, research institutions, industry, governmental institutions and NGOs. Shareen Doak, PATROLS Project Coordinator, Swansea University, added: "It has been fantastic to see so many participants, including early career researchers, actively engaged during the conference. We are very pleased as organisers that we could provide a virtual platform that still enabled scientific exchange not only within academia, but also with industry and governmental institutions."

Among the many highlights of the event was the awards ceremony, in which prizes were presented for six categories. These included:

- Best Oral: Prof Em. Dr Harold Krug (Nanocase GmbH, Switzerland) - Hazard assessment in nanotoxicology - the CoCoN database science approach
- Best Student Oral: Battuja Batbajar Dugershaw (St Gallen Empa, Switzerland) - Indirect embryo-foetal risk of nanoparticles: Impact on human placental function, the release of placental signalling factors and subsequent alterations on angiogenic and neurodevelopment processes.
- Best Poster: Dr Tobias Lammel (University of Gothenburg, Sweden) - Toxicity assessment of nanoparticulate TiO<sub>2</sub> UV filter alone and in binary mixtures with organic UV filters using fish gill cells (RTgill-W<sub>1</sub>)
- Best Student Poster: Gerrit Bredeck (Leibniz Research Institute for Environmental Medicine, Germany) - Possible impact of foodborne engineered nanoparticles on the murine gut microbiome.

BIORIMA partners fully participated in the event's proceedings, with INIA reporting on three communications, including:

- David Hernández-Moreno, José María Navas, María Luisa Fernández Cruz, Lipid and iron nanobiomaterials only produce toxic effects in fish cell lines after a long-term exposure. Oral communication
- Kerstin Hund Rinke, Karsten Schlich, Cecilia Diaz Navarrete, Anne Jurack, Burkhard Knopf, María Luisa Fernández Cruz, David Hernández Moreno, Nicolas Manier, Pascal Pandard, Susana I.L. Gomes, Bruno Guimarães, Janeck J. Scott Fordsmand, Mónica J.B. Amorim; Experiences with a higher tier test design simulating environmental fate and effect of medical products after the use phase. Poster
- Mónica J.B. Amorim, María Luisa Fernández-Cruz, Kerstin Hund-Rinke and Janeck J. Scott-Fordsmand; Environmental hazard testing of nanobiomaterials. Poster

[Cntd →](#)



[Cntd →](#)

Additionally, under Theme 1 of the event: Hazard Characterisation of Nanomaterials and Advanced Materials, Subtheme: Environmental hazard characterization and mechanisms, the following research was presented:

“Lipid and iron nanobiomaterials only produce toxic effects in fish cell lines after a long-term exposure”

David Hernández-Moreno, José María Navas, María Luisa Fernández Cruz

Department of Environment and Agronomy,

National Institute of Agriculture and Food Research and Technology (INIA), Madrid, Spain,

[fcruz@inia.es](mailto:fcruz@inia.es)

### Introduction

The short and long-term toxicity of different nanobiomaterials (NBMs) were evaluated in vitro in different rainbow trout cell lines. The RTgill-W1, RTL-W1 and RTS-11 were exposed for 24h to a range of concentrations (0.78 – 100 µg/mL) of lipid (SLN-nutra-Dis, SLN-nutra-Sol and LP-eye) and Fe<sub>3</sub>O<sub>4</sub>PEG-PLGA NBMs. The RTgill-W1 was used for the long-term exposure to 20 and 100 µg/mL NBMs during 28d (weekly cell renewal). Recovery was also tested after a 14d exposure and 14d recovery periods.

### Results

None of the NBMs studied provoked cytotoxicity after 24h exposure at the used concentrations (IC<sub>50</sub>>100 µg/ mL). After 28 d exposure, none of the SLN-nutra NBMs exerted a toxic effect. However, LP-eye and Fe<sub>3</sub>O<sub>4</sub>PEGPLGA at the highest concentration caused a 50% decrease in cell viability. For these NBMs a concentrationrelated effect was observed. Cells previously exposed to Fe<sub>3</sub>O<sub>4</sub>PEG-PLGA for 14 d showed an almost complete recovery after 14 days in clean medium. However, cells exposed to 20 µg/mL of LP-eye recovered completely whereas no recovery was observed for cells pre-exposed to 100 µg/mL.

### Conclusions

These results evidence the need to test the long-term toxicity of NBMs and show differences in cytotoxicity for different NBMs probably associated to different mechanisms of toxic action. Rtgill-W1 cells are appropriate to screen short and long-term toxicity of NBMs providing valuable information about NBMs toxicity in fish.

### Summary

The NBMs assayed are not toxic after a short-term exposure for fish cell lines but the LP-eye and Fe<sub>3</sub>O<sub>4</sub>PEG-PLGA produce concentration-dependent long-term toxicities which can only be reversed in the case of the Fe<sub>3</sub>O<sub>4</sub>PEGPLGA NBMs.

### Acknowledgements:

This work was funded from the European Union’s Horizon 2020 Programme under Grant Agreement No 760928 (BIORIMA - BIOMaterial Risk Management). Colorobbia Consulting SRL (Italy) and Nanovector SRL (Italy) supplied the iron and lipid NBMs, respectively.

In the closing remarks, Lang Tran, Project Coordinator BIORIMA, Institute of Occupational Medicine (IOM) stated: “Our three projects are coming to an end but we are looking forward to showcasing final results at the next conference.”

The next conference—NanoTox 2024—will take place in Singapore.



GRACIOUS (Grant Agreement No 760840), PATROLS (Grant Agreement No 760813) and BIORIMA (Grant Agreement No 760928) have received funding from the European Union’s Horizon 2020 research and innovation programme.

## H2020 GRACIOUS Project events and dissemination activities

Dr Stella Stoycheva  
Stakeholder Engagement and Dissemination Manger  
Yordas Group  
[s.stoycheva@yordasgroup.com](mailto:s.stoycheva@yordasgroup.com)



Entering its final months, the H2020 GRACIOUS project is heavily focused on dissemination, exploitation and knowledge transfer activities.

### **Nanosafety Training School: From Basic Science to Risk Governance: 21-25 June 2021**

The 10th edition of the Venice NanoSafety Training School was held on a virtual platform. Due to the current COVID pandemic and the restrictions imposed by the Italian Government on face-to-face events, the Organising Committee took the difficult decision not to postpone it further but to organise the School as a virtual event to ensure the safety of all attendees. Attendance was free of charge and recordings have been made public on the NSC YouTube channel

### **Assessing Quality and Completeness of Nanosafety Data for Risk Assessment Purposes**

Using high quality data is essential for performing robust risk assessment of chemical substances, including engineered nanomaterials (NMs) but quality assessment information is currently not available for most of the available nanosafety datasets. To address this issue, the EU H2020 project GRACIOUS proposed a methodology to facilitate the evaluation of quality and completeness for sets of NM physicochemical and(eco)toxicological data based on established criteria: i.e., completeness, reliability, relevance and adequacy. This approach was discussed on 28 June in a meeting at which data experts and risk assessors from industry, regulation, and academia and in fact anyone interested in data management could join a lively discussion.

### **Final GRACIOUS Stakeholder Engagement and Exploitation Event: 13-15 September 2021**

Save the dates 13 - 15 September (afternoon sessions) for the GRACIOUS Final Stakeholder Engagement and Exploitation event to be held in a virtual platform. The workshop will feature interactive sessions aimed to present and discuss with stakeholders the GRACIOUS case studies and key exploitable results followed by hands-on training sessions on the GRACIOUS tools and approaches.

Expect more details here: <https://www.h2020gracious.eu/events>

### **Proceedings from The NanoTox Conference 2021**

The nanosafety community met virtually for the 10th International Conference on Nanotoxicology - NanoTox between 20th to 22nd April 2021. This year's conference was jointly organised by three leading EU Horizon 2020 Projects, BIORIMA, GRACIOUS, and PATROLS - focusing on the development of novel tools for evaluating human and environmental hazard, and strategies for nanomaterial characterization, grouping, and read-across for risk analysis.

Read more in our [Press Release](#)

### **Framework Development and Publications**

GRACIOUS has successfully generated a framework enabling practical application of grouping, and read-across of nanomaterials /nanofoms. The framework includes 40 pre-defined hypotheses (17 for human hazard, 23 for environmental hazards) to provide guidance. The GRACIOUS WIKI tool aids consistency in terminology across the project. Key scientific papers include:

- A framework for grouping and read-across of nanomaterials-supporting innovation and risk assessment, Stone et al., 2020, Nanotoday, 35, 10094.
- Quality of physicochemical data on nanomaterials: an assessment of data completeness and variability. Comandella et al., Nanoscale. 2020;12 7:4695-708.
- A review to support the derivation of a worst-case dermal penetration value for nanoparticles. Gimeno-Beneto et al. 2021. Regulatory Toxicology and Pharmacology119, 104836.
- Organomodified nanoclays induce less inflammation, acute phase response and genotoxicity than pristine nanoclays in mice lungs. Di Ianni et al. 2020. Nanotoxicology 2020 14:7, 869-892
- Understanding Dissolution Rates via Continuous Flow Systems with Physiologically Relevant Metal Ion Saturation in Lysosome. Keller et al. 2020. Nanomaterials 2020 12; 10(2):31.
- A method to assess the relevance of nanomaterial dissolution during reactivity testing. Peijnenburg et al.. 2020. Materials 2020 13;13(10):2235

A special issue of NanoImpact is under preparation to include 12 GRACIOUS manuscripts on similarity assessment methods. Check out our latest publications [HERE](#).

## CHARISMA shares its latest developments



Besa Maliqi Sylva

Yordas Group

[b.maliqisylva@yordasgroup.com](mailto:b.maliqisylva@yordasgroup.com)

The CHARISMA Project has issued its [latest Newsletter](#). Here are some of the highlights:

On 11-12 May CHARISMA successfully held their 6 month-Consortium Meeting virtually. The project partners presented an overview of the actual developments. The project is currently in the preparation phase to implement the Raman-based harmonisation tools and procedures developed in CHARISMA in three industrial case studies:

- Nanomaterials Synthesis
- Security Nanomarkers
- Food Safety and Traceability

We therefore expect the lab-style Raman set-up and hardware, software and optical probes ready by end of this year to demonstrate in M24.

For this, a list of key parameters and samples, as well as a data structure for harmonised Raman data have already been defined to support CHARISMA's objective to propose several protocols to standardise the way Raman spectra are generated and used in a broad number of industrial applications. This will allow us to quantitatively compare Raman spectra of a given sample regardless of whether this is acquired with a handheld or a high-end Raman system. This harmonization will be instrumental to ensure the one-material/one-characterization paradigm necessary for, e.g., nanosafety assessment.

### Meet the team

We would like to introduce you to Miguel A. Bañares, PhD Chemistry, Research Full Professor, CSIC

Miguel is the Project Coordinator of CHARISMA. He is based at the ICP (Institute for Catalysis and Petrochemistry) at CSIC and brings not only his passion about Raman spectroscopy, but also his vast experience on advanced Raman characterisation during in situ and operando conditions to the CHARISMA project. He is an expert in operando Raman spectroscopy (the term operando was coined by this group back in 2000) for characterization of functional materials when environmental conditions change (hydration, reduction, oxidation, catalytic reaction) to assess structure-performance relationships at a molecular scale.



As Project Coordinator, Miguel leads CHARISMA WP1 (Scientific Management).

More project updates can be found on [www.h2020charisma.eu](http://www.h2020charisma.eu) and you can follow us on Twitter @h2020charisma

## NanoPAT reports its progress in Newsletter

#2

### Project status

The project reached its first year of life in June 2021. The previous year was a key period for the success of the project with a lot of activity and significant results in PDW, TUS and OF2i nano monitoring techniques. Technology providers, research technology organizations and demonstrators have worked together in order to prepare the transition from laboratory level to the industrial field for the validation of those techniques. At the same time, partners in the communication field are leading the way of dissemination of our activity in order for the work done to find its position in the industry.



Online real-time characterisation solutions for nanoparticle production processes

For each of the three PDW cases (silica particles @ UP, zeolites @ ZHAW, polymers @ UPV), at least one industrial process has been successfully replicated in lab-scale at the corresponding RTO. UP and ZHAW have monitored the production processes with first online PDW spectroscopy measurements and are currently optimising the measurement parameters. The third PDW spectrometer for UPV is about to be completed and delivered to the POLYMAT team.

Meanwhile, a PhD student from POLYMAT will visit UP over the month of June for training and networking purposes. ZHAW is currently looking to organise a similar exchange of one of their students at the UP.

Within the last months, BRAVE and MUG teams worked together with Cnano and FLUIDINOVA on downscaling their production to lab conditions. They succeeded to fully simulate the processes and offline characterization measurements, together with reference methods, were performed. Current online measurements are in progress. Furthermore, BRAVE's team optimized and adapted the OF2i hardware, software and underlying physical models to reach the next steps of full PAT simulation at TRL5 level.

IRIS in collaboration with UPV tested the laboratory level TUS setup with polymeric nanoparticles and proved that the system is capable of detecting their sizes. At the same time, IRIS is building and testing the RTO level TUS setup that will be sent to UPV at the end of May for extensive calibration. Additionally, IRIS is developing a dilution system that will allow the nanoparticle measurements even in the case of high solid content solutions

Finally, NanoPAT will be at EuroPACT 2021—the 5th European Conference on Process Analytics and Control Technology, taking place in Copenhagen from 15th—17th November.

EUROPACT 2021 focusses on featuring innovation along the following three pillars:

1. Process Analytics in Real-World Manufacturing
2. From Data to Process Monitoring, Control and Optimization
3. Novel PAT and Instrumental Technologies

Read more about NanoPAT's latest developments here: [NanoPAT\\_Newsletter\\_2.pdf](#)

Cntd →

## NanoPAT – Process Analytical Technologies for Industrial Nanoparticle Production

Beatriz Alfaro Serrano  
[beatriz.alfaro@bnn.at](mailto:beatriz.alfaro@bnn.at)  
 BioNanoNet Forschungsgesellschaft mbH (BNN)



NanoPAT is the acronym for “*Process Analytical Technologies for Industrial Nanoparticle Production*”, a research project funded in the frame of *EU Horizon 2020 research and innovation programme*. It is one of the six projects that have been funded under the NMBP-08 call (DT-NMBP-08-2019 - Real-time nano-characterisation technologies (RIA)): NanoPAT, CHALLENGES, RealNano, PAT4Nano, NanoBat, NanoQI.

While bulk materials have constant physical properties independent of their size, the physical and chemical properties of a nanoparticle are dictated by its size. Accurate characterisation of mean size, size distribution and shape is key to the efficient manufacturing of high-quality nanomaterials. The EU-funded NanoPAT project plans to use three new real-time analytical tools that overcome problems and limitations of conventional characterisation technologies. The new process analytical technologies (PAT) will be photon density wave spectroscopy (PDW), optofluidic force induction (OF2i) and turbidity spectrometry (TUS). The innovative technologies will be combined with new data analysis methods to provide, for the first time, real-time analysis of particles on the nanometre scale with sub-minute temporal resolution.



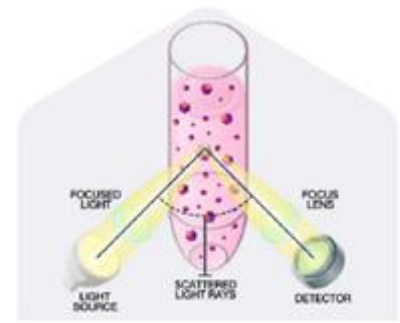
### Photon Density Wave Spectroscopy

An inline process analytical technology capable of calibration-free quantification of light absorption and light scattering in highly turbid, highly concentrated liquid dispersions.



### OptoFluidic Force Induction

Photons carry momentum, spin- and angular momentum, not as much to be noticeable in our makro everyday life, but enough for being active in the nanoworld.



### TURbidity Spectrometry

A flexible optical technique for monitoring the evolution of suspending particles which size ranges from approx. 100 nm up to few microns.

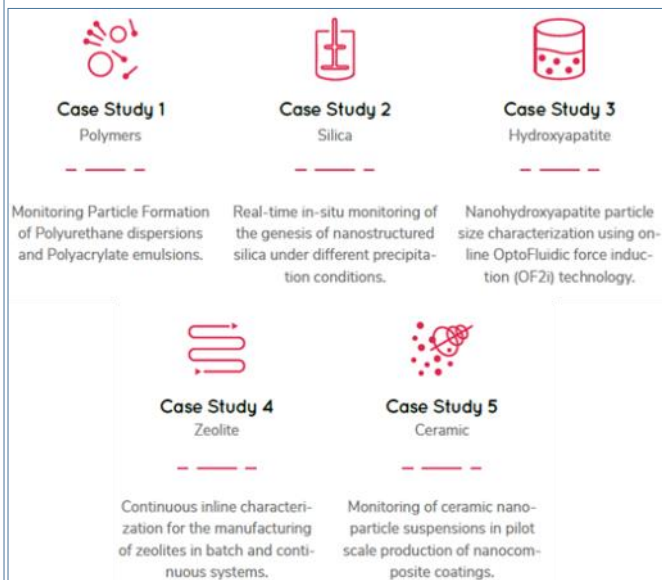
**Image:** The three novel complementary **real-time in situ particle size characterisation technologies** that are being further developed in NanoPAT

[Cntd →](#)

Cntd →

NanoPAT has a very broad potential for monitoring the synthesis and conversion processes involving an infinite variety of NPs and media types.

As a subset representative of this potential, NanoPAT will validate the combination of different nano-characterization technologies in five industrial case-studies, demonstrating the viability of the proposed PAT solutions for the industrial NPs production of polymers, silica, hydroxyapatite, zeolites and for the dispersion of ceramic NPs into coatings via electrodeposition method.



The 16 EU partners of this project, are distributed across 8 European countries which has a duration of 48 months (June 2020 – May 2024).

NanoPAT team consist of 16 EU partners which come from academia, industries (SMEs and large industry) and research organisations distributed across 8 European countries, bringing together solid scientific knowhow in the relevant fields and strong industrial and commercial involvement to ensure that the value chain of commercial actions can progress swiftly towards the introduction of **new real-time solutions for the monitoring of nanoparticle production processes.**

In June 2020, the NanoPAT project successfully kicked-off virtually due to the well-known Covid-side effects!

The project is reaching its first year of life next month (June 2021). The previous year was a key period for the success of the project with a lot of activity and significant results in PDW, TUS and OF2i nano monitoring techniques. Technology providers, research technology organizations and demonstrators have worked together in order to prepare the transition from laboratory level to the industrial field for the validation of those techniques. At the same time, partners in the communication field are leading the way of dissemination of our activity in order for the work done to find its position in the industry.

Further information about the NanoPAT project can be found on the [project website](#).

Connect with NanoPAT:



This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 862583.

## Filling the Nanosafety data gaps: Towards FAIR Nanosafety Data.

NanoReg2

Billions of euros has been invested by both the private and public sector in nanotechnology research to help advance this key enabling technology. Several large-scale collaborative projects have investigated the environmental and human health aspects of nanomaterials. There has been a clear gap on the reuse of data between various projects and an even larger chasm between the data produced in projects and its use by industry for safety and regulatory use. Linked with this is the need for faster, more efficient materials testing, especially in the area of emerging advanced materials and the need to comply with regulatory demands whilst also reducing the number of animals used to test chemicals.

The NanoReg2 project was one of the largest investments made in nanosafety research by the European Commission. It brought together 42 partners to work on the challenge of coupling safe-by-design (SbD) and grouping strategies with the regulatory requirements for nanomaterials.

## ANALYSIS

<https://doi.org/10.1038/n41565-021-00911-6>
nature  
nanotechnology

### Towards FAIR nanosafety data

Nina Jeliaskova<sup>1,2</sup>, Margarita D. Apostolova<sup>2</sup>, Cristina Andreoli<sup>2</sup>, Flavia Barone<sup>3</sup>, Andrew Barrick<sup>4</sup>, Chiara Battistelli<sup>5</sup>, Cecilia Bossa<sup>6</sup>, Alina Botea-Petcu<sup>7</sup>, Amélie Châtel<sup>8</sup>, Isabella De Angelis<sup>9</sup>, Maria Dusinska<sup>6</sup>, Naouale El Yamani<sup>6</sup>, Daniela Gheorghe<sup>5</sup>, Anna Giusti<sup>7</sup>, Paloma Gómez-Fernández<sup>10</sup>, Roland Grafström<sup>11</sup>, Maciej Gromelski<sup>12</sup>, Nicklas Raun Jacobsen<sup>13</sup>, Vedrin Jeliaskov<sup>1</sup>, Keld Alstrup Jensen<sup>13</sup>, Nikolay Kochev<sup>14</sup>, Pekka Kohonen<sup>15</sup>, Nicolas Manier<sup>16</sup>, Espen Mariussen<sup>6</sup>, Agnieszka Mech<sup>16</sup>, José Maria Navas<sup>17</sup>, Vessalina Paskaleva<sup>14</sup>, Aurica Precupas<sup>18</sup>, Tomasz Puzyn<sup>12</sup>, Kirsten Rasmussen<sup>16</sup>, Peter Ritchie<sup>19</sup>, Isabel Rodriguez Llopis<sup>20</sup>, Elise Rundén-Pran<sup>21</sup>, Romica Sandu<sup>22</sup>, Neeraj Shandilya<sup>19</sup>, Speranta Tanasescu<sup>23</sup>, Andrea Haase<sup>24</sup> and Penny Nymark<sup>25</sup>

Nanotechnology is a key enabling technology with billions of euros in global investment from public funding, which include large collaborative projects that have investigated environmental and health safety aspects of nanomaterials, but the reuse of accumulated data is clearly lagging behind. Here we summarize challenges and provide recommendations for the efficient reuse of nanosafety data, in line with the recently established FAIR (findable, accessible, interoperable and reusable) guiding principles. We describe the FAIR-aligned Nanosafety Data Interface, with an aggregated findability, accessibility and interoperability across physicochemical, bio-nano interaction, human toxicity, omics, ecotoxicological and exposure data. Overall, we illustrate a much-needed path towards standards for the optimized use of existing data, which avoids duplication of efforts, and provides a multitude of options to promote safe and sustainable nanotechnology.

hope that this article will help others to understand why it is crucial for nanosafety data to be fair, but also to see a practical approach that was taken to make large sets of data available following FAIR principles.”

“We have managed to bring together a lot of know-how in this article”, says co-author Dr Penny Nymark of the Swedish Karolinska Institutet. “We show how data needs to be gathered, stored, and re-used by using the data from NanoReg2. This project has brought together data from a number of other EU funded projects and has created one of the largest nanosafety data sets in the world”.

Alongside the article, NanoReg2 project data has also been made available under Creative Common Licence and is available now for other to use.

### About NanoReg2

NanoReg2 was funded under the European Union’s Horizon Research and Innovation programme, Grant Agreement No. 646221. The project ran between 2015 — 2019 under the coordination of INERIS and brought together 42 partners from 15 countries to work on this €10m project. The project worked to help address the challenge of coupling safe-by-design (SbD) and grouping strategies with the regulatory processes for nanomaterials. Data from NanoReg2 has been made available to subsequent nanosafety and nano risk governance projects and the grouping and SbD methodologies have been published in several articles and have been developed further in ongoing Horizon 2020 projects such as Gracious and Gov4Nano.

### Further information

For media enquiries contact the Nanotechnology Industries Association’s Communications and Project Officer Nikolina Latković via [nikolina.latkovic@nanotechia.org](mailto:nikolina.latkovic@nanotechia.org)



## TNO Launches LICARA Innovation Scan

Dr. ir. W. (Wouter) Fransman  
Senior Scientist  
RAPID  
[wouter.fransman@tno.nl](mailto:wouter.fransman@tno.nl)



TNO HAS developed the LICARA Innovation Scan. The LICARA Nano Scan was originally developed in the EU LICARA project by TNO and EMPA to guide companies through their decision-making process for the sustainable development of new innovative nano-enabled products and has now been extended for non-nanomaterials.

### LICARA Innovation Scan for qualitative risk-benefit analysis

The LICARA Innovation Scan is a web-based tool that guides companies through their decision-making process for the sustainable development of new innovative products. It is a simple yet effective tool for risk-benefit analysis over a product's entire life cycle at an early innovation stage where limited information is available. For nano-product specific innovation, we now offer an updated version of the well-known LICARA Nano Scan, while for non-nano innovative products we now introduce the LICARA Innovation Scan. LICARA Innovation Scan uses the principles of Life Cycle Assessment, Risk Assessment and Multi-Criteria Decision Assessment to evaluate:

- (i) product benefits in terms of its economic, environmental and social opportunities and
- (ii) specific risks for consumers, workers, the public and the environment.

The final outcome of product's strengths and weaknesses includes uncertainties and knowledge gaps about the product development which supports product manufacturers and their stakeholders in their decision-making process.

**Are you interested in the qualitative risk-benefit analysis? Then try out TNO's LICARA Innovation Scan. Or contact us to discover how we can help you in the decision-making process for the sustainable development of new innovative products.**

<https://www.tno.nl/en/about-tno/news/2021/3/tno-launches-licara-innovation-scan/>





**CUSP**The European Research Cluster to  
Understand the Health Impacts  
of Micro- and Nanoplastics[www.cusp-research.eu](http://www.cusp-research.eu)[hello@cusp-research.eu](mailto:hello@cusp-research.eu)**FROM EARLY LIFE TO ADULTHOOD:  
WHAT'S THE IMPACT OF MICRO- AND NANOPLASTICS IN THE HUMAN BODY?**

The CUSP cluster is a newly funded EU initiative to answer key micro- and nanoplastics related questions on human health and provide policy-relevant scientific data.

**June 11<sup>th</sup>, 2021:** 75 organizations from 21 countries forming five large-scale projects came together to give birth to the *European research cluster to understand the health impacts of micro- and nanoplastics, CUSP*. Funded by the European Commission with EUR 30 million, a multidisciplinary team of scientists, industry and policymakers will collaborate in this unprecedented research effort over the next five years. Within CUSP, the different projects will investigate the complex relationship between micro- and nanoplastics (MNPs) and human health. The team will be focusing in particular on exposure routes, hazard and risk assessment, and the development of new analytical tools to measure, characterize and quantify MNPs. A large audience of stakeholders and interested citizens logged in on June 9<sup>th</sup>, to launch CUSP in an online kick-off meeting with CUSP project members and representatives from the European Commission.

**Micro- and Nanoplastics are everywhere**

The presence of micro- and nanoplastics (MNPs) in the environment is of great concern to society. The small plastic particles emanate from the degradation of larger plastic items or are intentionally manufactured and added to commercial products such as cosmetics, synthetic textiles, or paints. It has become clear that MNPs are part of people's lives all around the globe. We inadvertently ingest them through the food we eat and the water we drink, and we inhale them through the air we breathe. Pollutants, such as heavy metals, allergens, toxicants, and microorganisms, can latch on to these particles and may further endanger the environment as well as human and animal health. Despite the ubiquitous presence of MNPs all around us, currently we have neither the tools for measuring and characterizing them with exactitude, nor the understanding of where they end up in our bodies after exposure and the effects they have on our health.

**The European Union is spearheading efforts in research on MNPs**

In response to this global challenge, the European Union has committed itself to leading efforts in advancing our understanding of MNPs and their impacts on human health. This entails the development of human health hazard and risk assessment methodologies, including preliminary investigations into long-term impacts. CUSP research results will contribute to the health-relevant aims of the European Strategy for Plastics in a Circular Economy and the Bioeconomy Strategy, as well as the REACH restrictions on intentionally added MNPs to products, by providing new evidence for better preventive policies. "The current regulatory framework cannot ensure that micro- and nanoplastics present in the air, and in food and beverage products are at safe levels for the population. Furthermore, the positive effects of reduce/recycle/reuse will take a long time. That is why we need solid scientifically based knowledge related to their potential risks and mechanisms of action.", explained Prof. Ricard Marcos, from the Autonomous University of Barcelona and Coordinator of Plasticheal, one of the five CUSP projects.

[Cntd →](#)

**Cntd →** Based on this study we plan to take action”, affirmed Paulo Da Silva Lemos, speaker from the European Commission’s Sustainable Products and Plastics Unit during the online conference, further endorsing this contribution to the reduction of the release of micro- and nanoplastics into the environment.

Carmen Laplaza-Santos from the European Commission’s Directorate-General for Research and Innovation explained that 51 proposals were submitted when they opened the call for submissions on this topic in 2018, “the highest number ever received in an environmental and health related call for proposals, which attests to the high interest of the scientific community in this topic”.

Complex phenomena, such as the global presence of MNPs in our environment, can only be dealt with effectively by uniting strengths and dealing with this issue on a large scale. Uniting five research initiatives in one large cluster will engender synergies and amplify the efforts of individual research initiatives. The CUSP team will work closely with the European Commission’s Joint Research Centre to enhance the impact of their research and to make sure there is a constant dialogue between science and policymaking. “There is unanimous opinion that there are major knowledge gaps, resulting largely from a lack of analytical methods”, stated Birgit Sokull-Kluettgen from the European Commission’s Joint Research Centre, adding that, “the measuring problem is even larger for the smallest plastic items, the nanoplastics”.

Dr. Tanja Ćirković Veličković from the Faculty of Chemistry at the University of Belgrade, who chairs the CUSP cluster this year and coordinates IMPTOX, one of the five CUSP projects, hopes that their research will help, “to better assess the risks of micro- and nanoplastics, and create a scientific basis for future EU guidelines and early warnings to safeguard human health.”

### **The five founding projects of CUSP**

The five multidisciplinary research consortia that brought to life the CUSP cluster mainly comprise universities and research institutions as well as small- and medium-sized enterprises, NGOs, non-for-profit organizations, industry, and governmental institutions. They will focus on investigating different aspects related to MNPs and health, such as the possible harmful impact of MNPs on pregnancy and early life; the relationship between MNPs, allergic diseases and asthma; the impact of MNPs on the human intestinal tract and the immune system; as well as the development of a comprehensive measurement and testing program. For more details on the individual projects, please consult the attached factsheet.

### **Science to Policy**

The online conference – a partner event of this year’s EU Green Week - featured speakers from the European Commission as well as the coordinators of the five research projects. In a lively panel discussion where the audience contributed with questions and comments, scientists addressed in particular how we are exposed to micro- and nanoplastics; what kinds of risks they may pose once inside the human body; and which methodological challenges scientists are facing to find out. “We need to produce results that are comparable”, stated Dr. Rudolf Reuther Scientific-Coordinator of PlasticsFatE from Environmental Assessments in Germany. He added, “There is a wealth of studies going on, but the results cannot be compared because of a lack of harmonized methods. This will be something we hope to avoid among the five CUSP projects.”

Prof. Tanja Ćirković Veličković pointed out that, “MNP surfaces may attract and retain hazardous contaminants, such as metals, allergens, pathogenic bacteria and toxins, and deliver them into the body. Little is known so far on how MNPs and their pollutants influence allergic diseases and asthma.”

“In the five different CUSP projects, we focus on generating the scientific evidence that is essential to carry out a detailed risk assessment”, explained Prof. Roel Vermeulen, from the University Medical Centre Utrecht and the coordinator of AURORA, in an online networking event organized by the 2021 EU Green

**Cntd →**

**Cntd** → Week on June 3rd. “The risk at the moment is very uncertain but scientifically plausible and could affect future generations, which is why we should be filling this knowledge gap urgently”, stated Dr. Heather Leslie from VU Amsterdam and Co-Coordinator of POLYRISK.

The launch videos are now available to [watch on YouTube](#):

The CUSP team met again on June 10<sup>th</sup> for their first internal annual meeting, where they discussed how to coordinate research efforts among CUSP partner organizations over the coming years.

The five projects are:

**AURORA** - Grant No. 964827

Actionable eUropean ROadmap for early-life health Risk Assessment of micro- and nanoplastics



**ImpTox** - Grant No. No. 965173

An Innovative analytical platform to investigate the effect and toxicity of micro and nano plastics combined with environmental contaminants on the risk of allergic disease



**PLASTICHEAL** - Grant No. No. 965196

Innovative tools to study the impact and mode of action of micro and nanoplastics on human health: towards a knowledge base for risk assessment



**PlasticsFatE** - Grant No. No. 965367

Plastics Fate and Effects in the human body



**POLYRISK** - Grant No. No.964766

Understanding human exposure and health hazard of micro- and nanoplastic contaminants in our environment



For more information:

[Join the CUSP Community](#)

[Visit our website](#)

[Join the CUSP LinkedIn Group](#)

[Follow us on twitter](#)

[Watch CUSP activities on YouTube](#)



## BIO-PLASTICS EUROPE AND SEALIVE

### Opportunities and constraints in EU policy for bio-based and biodegradable plastics



While not strictly NSC related, as more and more NSC partners and affiliated entities become involved in the research surrounding micro and nanoplastics, it may be of interest that BIO-PLASTICS EUROPE, together with H2020 project SEALIVE, recently organised the 4th meeting of the European Bioplastics Research Network: the network was created to promote exchange between researcher and the bio-based plastic industry sector.

The event, titled "Opportunities and Constraints in EU policy for Bio-based and Biodegradable Plastics", began with an official welcome from BIO-PLASTICS EUROPE Project Coordinator, Prof Walter Leal, Hamburg University of Applied Sciences, DE and SEALIVE Project Coordinator, Ms. Miriam Gallur, ITENE, ES. This was followed by a number of informative presentations, including:

- EU research and innovation policies on bio-based and biodegradable plastics  
Dr. Silvia Maltagliati, EU Policy Officer
- Accelerating the circular economy through EU research projects – insights from BIO-PLASTICS EUROPE and SEALIVE projects:  
BIO-PLASTICS EUROPE and SEALIVE Project Coordinators
- Scoping EU policies and their interaction with bio-based plastics  
Andrew Frammer, IEEP, UK
- Facilitating stakeholder contribution to EU policies through engagement in Bio-based Plastics Research Projects  
Jill Adams, Prospex Institute, BE

After a dynamic panel discussion, Dr. Jelena Barbir, Hamburg University of Applied Sciences, DE, closed the meeting.

BIO-PLASTICS EUROPE has 22 partners from Europe plus one in Malaysia; it began back in October 2019 and will continue until September 2023.

You can connect with BIO-PLASTICS EUROPE on:

The website <https://bioplasticseurope.eu/>

Twitter [https://twitter.com/bioplastics\\_eu](https://twitter.com/bioplastics_eu)

LinkedIn <https://www.linkedin.com/in/bio-plastics-europe-9641a21b4/>

Instagram [https://www.instagram.com/bioplastics\\_eu/](https://www.instagram.com/bioplastics_eu/)

For more information, contact [Cintia.Nunes@haw-hamburg.de](mailto:Cintia.Nunes@haw-hamburg.de)  
Project Manager Climate Change and Digital Learning

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement BIOPLASTICS EUROPE No. 860407 and SEALIVE No. 862910



## Opportunities to contribute to ECHA/EUON market research study

Nikolina Latkovic,  
Communications and Project Officer  
Nanotechnology Industries Association,  
[nikolina.latkovic@nanotechia.org](mailto:nikolina.latkovic@nanotechia.org)



NIA member NovaMechanics is carrying out a market research project on behalf of ECHA and the European Observatory for Nanomaterials (EUON), with the goal of producing an analysis of the current state of play of the EU nanomaterials market (key operators, type of substances, volumes and uses thereof). The project will also create focus groups with the further goal of developing projections of the nanomaterials market growth over the next five years. Interested stakeholders have the opportunity to contribute to the work by replying to a brief survey (input can be flagged as confidential and will be treated as such), and/or by participating in the focus groups.

To take part in the survey, [please click here](#). If you wish to get involved in a focus group or have any questions about the work, please contact the NovaMechanics project lead Dr Antreas Afantitis, [afantitis@novamechanics.com](mailto:afantitis@novamechanics.com).

## The BNN Newsletter

The BNN Newsletter is out, and [available to download](#) now!

In addition to scientific contributions from our BioNanoNet members, reports about projects and activities and an overview of interesting publications, the newsletter highlights presentations from BioNanoNet members



## The NanoLabNL Newsletter

NanoLabNL have just issued a newsletter to keep you informed on the developments in and around their laboratories. The NanoLabNL newsletter also shares stories and progress on (research) projects conducted at their facilities. [Read the full newsletter online](#)



## New website and LinkedIn profile

NanoLabNL recently launched a new website. They have made it easier to navigate and it is visually more consistent. The website features a new voucher application form, and news articles are highlighted more prominently. They also created a public LinkedIn profile. Going forward they intend to use these channels to provide visitors with news, scientific background stories and information on lab equipment at each location.

[Check out www.nanolabnl.nl](http://www.nanolabnl.nl)

[Follow us on LinkedIn](#)

[Subscribe to our newsletter now](#)

## SweNanoSafe – now in English

The Swedish National Platform for Nanosafety, SweNanoSafe, is showcasing an updated [website](#), now with information in English as well



The platform also features a brand new [LinkedIn profile](#), which will continuously report about ongoing activities (also in English). The latest releases in English include a report on [Nanosafety and Education](#) featuring a roadmap towards improving training and education within the field. In addition, a report on Nanomaterials in the Environment is scheduled for release in English within the next month. A workshop report on the same topic from the 3<sup>rd</sup> Annual Workshop of the SweNanoSafe Research Network can be found [here](#).



## NanoImpact—Special Issue on Micro-and Nanoplastics: Environmental and Health Implications

Plastic products have been extensively utilized in every sector of life and lead to large amount discharge into the environment. Since the discovery of large amount of tiny plastic particles in the marine environment, numerous studies have been conducted to understand the sources, occurrence, fate and effects of micro and nanoplastics (MNPs). So far, MNPs especially microplastics have been extensively discovered in various environmental matrices, food, plants, and animals. Moreover, MNPs showed diverse impacts on aquatic and biotic environment.

Although the study of MNPs has becoming a hot topic and plentiful knowledge on the environmental MNPs has been achieved in recent years, there is still a large knowledge gap and globally raising concerns of MNPs. For example, the sampling and characterization of nanoplastics is still of great challenges. The controversy of MNP uptake and elimination is still prevalent. A special issue on the achievements and future perspectives on this subject will greatly promote related research in this domain.

This special issue is designed to emphasize the new research achievements on the occurrence, characterization, fate, eco and human toxicity, and removal of MNPs in different environmental matrices. Papers included but not limited to these aspects are very welcome. We believe this special issue is of general interest for researchers and readers in this emerging field of research.

### Guest Editors

Prof. Dr. Christian Laforsch, University of Bayreuth, Germany; Prof. Dr. Jing-Fu Liu, Chinese Academy of Sciences (CAS), Beijing, China; Prof. Dr. Fang Mingliang, Nanyang Technological University, China; Glen Deloid, MD, Harvard T.H. Chan School of Public Health, USA

**Submission Deadline:** December 31st, 2021; **Acceptance Deadline:** April 30th, 2022 ; **Impact Factor:** 5.478



## Frontiers of Nanotechnology and Toxicology

Special editions of Frontiers of Nanotechnology and Frontiers of Toxicology are inviting the community to submit papers.

These links provide descriptions of the two research topics and more information:

- [Where Nano Meets Bio: Advances Towards the Understanding of the Bio-Nano Interface | Frontiers Research Topic \(frontiersin.org\)](#)  
(Ass. Editor Marco Monopoli)  
We welcome contributions on the interactions of nanomaterials with biological entities, including both original research papers, as well as mini-reviews/perspectives and review papers.  
Deadline: end of July (abstract); 28 November 2021 (manuscript)
- [Methods and Protocols in Nanotoxicology | Frontiers Research Topic \(frontiersin.org\)](#)  
(Special Chief Editors: Bengt Fadeel and Maria Dusinska)  
This Research Topic collection of Methods and Protocols in Nanotoxicology will focus on models and methods to increase the quality of nanotoxicology research, and contribute to the hazard and risk assessment of nanomaterial.  
Deadline: 30 September 2021.

Cntd →



## PATROLS reports on its excellent output

Nikolina Latkovic  
Communications and Project Officer,  
Nanotechnology Industries Association  
[nikolina.latkovic@nanotechia.org](mailto:nikolina.latkovic@nanotechia.org)



# PATROLS

Advanced Tools for NanoSafety Testing

As the PATROLS project enters its final year, the last 6 months have resulted in some excellent results, including the following publications and factsheets:

### Publications:


- [Adverse Outcome Pathway Development for Assessment of Lung Carcinogenicity by Nanoparticles](#)
- [Breathing in vitro: Designs and applications of engineered lung models](#)
- [Inter-laboratory variability of A549 epithelial cells grown under submerged and air-liquid interface conditions](#)
- [Effects of humic substances on the aqueous stability of cerium dioxide nanoparticles and their toxicity to aquatic organisms](#)
- [Time dependent impact of copper oxide nanomaterials on the expression of genes associated with oxidative stress, metal binding, inflammation and mucus secretion in single and co-culture intestinal in vitro models](#)
- [The Use of Nanomaterial In Vivo Organ Burden Data for In Vitro Dose Setting](#)
- [Adsorption of titanium dioxide nanoparticles onto zebrafish eggs affects colonizing microbiota](#)
- [Transcriptomics-Based and AOP-Informed Structure–Activity Relationships to Predict Pulmonary Pathology Induced by Multiwalled Carbon Nanotubes](#)
- [Opportunities and Challenges for Integrating New In Vitro Methodologies in Hazard Testing and Risk Assessment](#)
- [Simulating Nanomaterial Transformation in Cascaded Biological Compartments to Enhance the Physiological Relevance of In Vitro Dosing Regimes: Optional or Required?](#)

### Expert factsheets:

- [Lung cell models for short and long term engineered nanomaterial exposure at an air-liquid interface](#)
- [Advanced lung models with \(patho\)physiological relevance to assess long-term effects of engineered nanomaterials](#)
- [Intestinal 3D models to assess nanomaterial toxicity in vitro](#)
- [Cell-line based 3D Liver models that can be utilised for nanomaterial toxicity and genotoxicity assessment in vitro](#)
- [LEVITATT \(LED Vertical Illumination Table for Algal Toxicity Test\)](#)
- [AOP to support the use of QSAR models](#)
- [Robust lysosomal dissolution media](#)

### Policymakers factsheets

- [Increasing regulatory reliability of ecotoxicity tests of nanomaterials](#)
- [Enhancing the Physiological Relevance of a 3D In Vitro Liver Model for Engineered Nanomaterial Hazard Assessment](#)
- [Gaining knowledge regarding alternative models in the premise of reducing/replacing animal experimentation – in silico models](#)
- [Cell-based 3D models of the intestine - 3Rs in nanosafety studies](#)
- [Distribution of engineered nanomaterials in the body](#)



## PATROLS

Advanced Tools for NanoSafety Testing

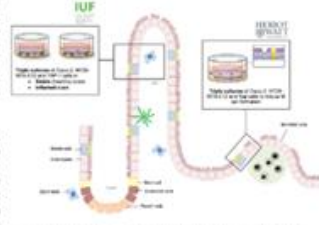
---

Intestinal 3D models to assess nanomaterial toxicity in vitro

For the uptake of engineered nanomaterials (ENM) the intestine is one of the main exposure routes to consider. Whereas it was long neglected in its role as entrance site and possible target organ for ENM, research efforts have increased recently.

In PATROLS two advanced in vitro systems were developed to represent different characteristics of the human intestinal tract (Figure 1). One model incorporates immuno-competent cells and can mimic the intestine in healthy or inflamed-like state. It is especially suitable to study the effects of impaired health on (nanomaterial) toxicity. The second model focuses on their inclusion of specialized cells for the uptake of macromolecules and particles, and is therefore particularly suitable to investigate the uptake of nanomaterials.

Outcome 1: Using these models, it was demonstrated that complex multi-cell-type cultures are more robust towards the exposure to ENM than typically used enterocyte monolayers and show promising similarity to the outcomes from in vivo feeding studies. (Kämpfer et al., 2021; DOI 10.1002/jnm.202004223)



Outcome 2: It was shown again that impaired tissue integrity induced by an inflammation-like state can influence the effects of ENM in the intestinal in vitro model. This observation may suggest that individuals suffering from inflammatory health conditions involving the intestine, e.g. Crohn's disease or ulcerative colitis, could face a different risk from ingested ENM. (Kämpfer et al., 2021; DOI 10.1002/jnm.202004223)

Outcome 3: The M cell model have been shown to be more sensitive to ENM and can translocate particulate substances more than the enterocyte monolayers. Therefore, our model may be more suitable for ENM toxicity and translocation studies than the enterocyte monolayers.

Figure 1. Schematic description of the intestinal in vitro models developed within PATROLS (adapted from Kämpfer et al. 2020; DOI 10.1021/acs.chemrestox.0c00076)

[www.patrols-H2020.eu](http://www.patrols-H2020.eu)

PATROLS is a project funded by the European Union under the Horizon 2020 research and innovation programme (grant agreement No. 101017711)

Cntd →

## SARS-CoV-2-Laden Respiratory Aerosol Deposition in the Lung Alveolar-Interstitial Region is a Potential Risk Factor for Severe Disease: A Modelling Study

by Sabine Hofer, Norbert Hofstätter, Albert Duschl and Martin Himly\*

Department of Biosciences, Paris Lodron University of Salzburg (PLUS), 5020 Salzburg, Austria

\***Martin Himly** [martin.himly@sbg.ac.at](mailto:martin.himly@sbg.ac.at)

Journal of Personalized Medicine. 2021; 11(5):431. <https://doi.org/10.3390/jpm11050431> [View Full Text](#)



NanoCommons  
Nano-Knowledge Community



### Abstract

COVID-19, predominantly a mild disease, is associated with more severe clinical manifestation upon pulmonary involvement. Virion-laden aerosols and droplets target different anatomical sites for deposition. Compared to droplets, aerosols more readily advance into the peripheral lung. We performed in silico modeling to confirm the secondary pulmonary lobules as the primary site of disease initiation. By taking different anatomical aerosol origins into consideration and reflecting aerosols from exhalation maneuvers breathing and vocalization, the physicochemical properties of generated respiratory aerosol particles were defined upon conversion to droplet nuclei by evaporation at ambient air. To provide detailed, spatially-resolved information on particle deposition in the thoracic region of the lung, a top-down refinement approach was employed. Our study presents evidence for hot spots of aerosol deposition in lung generations beyond the terminal bronchiole, with a maximum in the secondary pulmonary lobules and a high preference to the lower lobes of both lungs. In vivo, initial chest CT anomalies, the ground glass opacities, resulting from partial alveolar filling and interstitial thickening in the secondary pulmonary lobules, are likewise localized in these lung generations, with the highest frequency in both lower lobes and in the early stage of disease. Hence, our results suggest a disease initiation right there upon inhalation of virion-laden respiratory aerosols, linking the aerosol transmission route to pathogenesis associated with higher disease burden and identifying aerosol transmission as a new independent risk factor for developing a pulmonary phase with a severe outcome.

**Keywords:** aerosol transmission; COVID-19; disease initiation; droplet nuclei; epidemiology; etiology; ground glass opacity; pathogenesis; pathophysiology

"This research was supported by the EU H2020 projects NANORIGO and NanoCommons (grant numbers 814530 and 731032, respectively)."

## NIA releases position paper on nanoforms

Nikolina Latkovic,

Communications and Project Officer

Nanotechnology Industries Association,

[nikolina.latkovic@nanotechia.org](mailto:nikolina.latkovic@nanotechia.org)

NIA has released a position paper discussing the evolution of the [EU regulatory framework](#) and language used to talk about the nanoscale, [especially when referring to hazard profiles](#).

The ongoing transition from “nanomaterial” to “nanoforms” will help to better reflect the fact that differences in nanomaterial properties exist not only in relation to bulk counterparts, but also to nanoforms of the same substance.

[Download the full position paper](#)





## Research engineer (LTE)

### Modelling and characterization of a model aerosol containing viral particles.

#### Context

The Atomic Energy and Alternative Energies Commission (CEA) is a public scientific, technical and industrial research body (EPIC). Major player in research, development and innovation, the CEA operates in four areas: defence and security, low carbon energies, technological research for industry, and fundamental research. Relying on its recognized expertise, the CEA is involved in setting up collaborative projects with numerous academic and industrial partners.

In the framework of a multidisciplinary project, the CEA Fundamental Research Division, in collaboration with the CEA LETI et the CEA LITEN, develops novel approaches toward the characterization of viral particles in aerosol phase, a highly important current issue.

#### Missions :

We are seeking a research engineer specialized in fluid mechanics to take charge of two critical tasks in this project:

1. Conception and production of a model aerosol containing nanoparticles (inactivated virus).
2. Numerical simulations (Comsol) of an interface allowing efficient sampling of viral particles in an aerosol.

The applicant will interact with a multidisciplinary team composed of experts in aerosol generation, chemists and biologists specialized in viruses.

This limited term position (12 months) is based at CEA Grenoble, France.

**Starting date: November 2021.**

#### Profile :

You are an engineer or scientist (PhD) specialized in fluid dynamics. You are proficient in numerical simulations (Comsol), and have a good understanding of nanoscale processes. You favor transversality, teamwork, and possess strong analytical and priority management skills. A prior experience in aerosol characterization and basic knowledge of biology would be advantageous.

#### Contacts

Christophe Masselon [CEA IRIG] +33 4 38 78 10 92 christophe.masselon@cea.fr

Sébastien Artous [CEA LITEN] +33 4 38 78 52 80 sebastien.artous@cea.fr

Sébastien Hentz [CEA LETI] +33 4 38 78 28 91 sebastien.hentz@cea.fr





Join the PATROLS public workshop  
6th September 2021 – 15:00 CEST



**PATROLS**  
Advanced Tools for NanoSafety Testing

## Accurate effective dose assessment in vitro using PATROLS DosiGUI

A practical hands-on session for learning how to use an interactive software tool developed in PATROLS. DosiGUI can be used to determine effective nanomaterial dose metrics as a function of in vitro geometry, time, nanomaterial characteristics and the administered dose.

The software and files will be made available to participants so they can download and install the GUI and particle characteristic datasets before the workshop.

[Registration](#) is open!

Twitter: <https://twitter.com/nanotechia/status/1412792240741793793>

LinkedIn: <https://www.linkedin.com/feed/update/urn:li:activity:6817842003989012480>

PATROLS website: [https://www.patrols-h2020.eu/news-events/news/detail.php?we\\_objectID=285](https://www.patrols-h2020.eu/news-events/news/detail.php?we_objectID=285)

## Nanomed Europe 21

When? 7th – 9th September 2021

Where? St. Gallen, Switzerland

The 16th annual event of ETPN & the 4th ENM conference have merged into a unique event: #NME21. NME21 is a unique conference in Europe bringing together scientists, technology providers, entrepreneurs, industry and clinicians, all of them developing great medical applications of Nanotechnologies and emerging MedTech. For more details [Nanomed Europe 2021 | \(nme21.eu\)](https://www.nme21.eu)



**NanoMed Europe**  
September 7 - 9, 2021 - St. Gallen, Switzerland

## NIA holds 10th Annual Symposium

Nikolina Latkovic,  
Communications and Project Officer  
Nanotechnology Industries Association,  
[nikolina.latkovic@nanotechia.org](mailto:nikolina.latkovic@nanotechia.org)

The 10<sup>th</sup> annual NIA Symposium will take place remotely on Tuesday 19 October. The event, open to both NIA members and external participants, will discuss a number of relevant developments for the nano world: the evolution of policy and regulation; the potential of nanotechnology as a driver of sustainable growth; and examples of nano-enabled solutions for specific sectors.

Join us for a day of discussions with industry leaders, policy-makers and nano experts! Further information can be found [at this link](#).



[Cntd →](#)

## NMBP-13 Online workshop in autumn to explore the risk governance of nanomaterials

The NMBP-13 Portugal team is combining the power of two sister projects, RiskGONE and NANORIGO, to engage with audiences that harbour curiosity and interest in nanotech, nanomaterials and how we can regulate their production and usage.

Do you wonder what nanomaterials are or how H2020 projects funded by the European Commission are striving to create frameworks in which their development, application and disposal can be monitored so that public health, safety and the sense-of-security among citizens can be heightened?

Then join us, regardless of how much you know about nanotech and international regulation mechanisms, to learn about nanomaterials and share with us your point of view!

### About the workshop!

The two-hour workshop will be held online and moderated by experts from nanotechnology implementing the three NMBP-13 projects.

We will address the Risk Governance Council blueprint, bottom-up, **and try to grasp your feedback on a framework to implement it.**

Attendance is FREE!

Registration will open soon.

Stay tuned and keep watch for more news on the Nanorigo website and twitter account!

The event will be co-organised by Quercus, Social Factor and Portuguese Society of Innovation.

For more information, contact us at

[paulasilva@quercus.pt](mailto:paulasilva@quercus.pt);

[dalilaantunes@factorsocial.pt](mailto:dalilaantunes@factorsocial.pt);

[tedoraaibu@spi.pt](mailto:tedoraaibu@spi.pt)



The EU NanoSafety Cluster maximises the synergies between European-level projects addressing the safety of materials and technologies enabled by the use of nanoparticles. The studied aspects include toxicology, ecotoxicology, exposure assessment, mechanisms of interaction, risk assessment and standardisation.

The Cluster is an initiative of the European Commission Directorate-General for Research and Innovation (DG RTD), which sponsors these large projects. Overall, Europe targets safe and sustainable nanomaterials and nanotechnology innovations. Cluster projects contribute to assuring environmental health and safety (EHS) of this Key Enabling Technology.

**The Cluster also is an open platform for dialogue and exchange. Researchers, regulators, administrators, industry, civil society representatives and the general public are welcome to engage.**

**If you have an interest in EHS and nanotechnology, you are very welcome to participate in NSC activities whether or not you are a partner in formal European projects.**

- [Submit your news items here](#)
- [Subscribe to the NSC Community Mailing List here for your NSC Newsletter delivery](#)
- [Follow NSC Working Groups](#)
- [Join our LinkedIn Group](#)
- [Follow the NanoSafety Cluster on twitter](#)
- [Watch NSC project activities on our YouTube channel](#)
- [Find out about our International Cooperation activities](#)
- [Learn more about the NSC Projects](#)



[www.nanosafetycluster.eu](http://www.nanosafetycluster.eu)