

Welcome

Welcome to the 25th NSC Newsletter - and a bumper issue it is too.

We hope all's well with you, and thank you once again for your valuable support and input.

In an issue this size, some items need to be 'flagged up' in case they are missed, and so on p41 you'll see the [Call for Abstracts for Oral Presentations for 'Nano-week'](#). The closing date is **25th February**. This event, taking place alongside the [NanoCommons Final Conference](#) in Limassol, Cyprus from 20th – 24th June, is simply buzzing with ideas and activity, and is not one to be missed.

Opportunities abound, with [SAF€RA](#) announcing the imminent **7th joint call for proposals** (p36), and the NanoCommons project has made a **LAST CALL for applications for full support from the NanoCommons e-infrastructure** (p24). The closing date is 31st March.

The [BIORIMA](#) and [GRACIOUS](#) projects have now successfully completed and [share their final results](#) in this issue

Reading resources are plentiful here. [The Coordination Team](#) (p2) mention two vision papers that focus on the need for Safe by Design and sustainability issues and advocate a multisectoral approach critical for meaningful impact for society. [RIVM](#) has conducted an 'Inventory of research into Safe-by-Design Horizon2020 projects from 2013 to 2020', (p37); and the [NIA](#) provide a useful reading 'round-up' on p38. Links to video resources include a video of a joint NIA-NSC webinar on [Communicating about Nanomaterials](#) (p4); the recording of [BIORIMA's](#) Final Public Event (p5); a video presentation of a literature review carried out by [SABYDOMA](#) on [Safe-by-Design \(SbD\) in the current literature related to engineered nanomaterials \(ENM\)](#) (p30); and the recordings from the [NanoCommons](#) Knowledge Base demo and Electronic Laboratory Notebook hackathons (p19 and 22).

If 'hands-on' is your preferred approach, have a look at p31, where [NanoSolveIT](#) provides a link to the full range of available models & tools, while [RIVM](#) (NL), [BfR](#), [BAuA](#) and [UBA](#) (GER) have developed a new system to systematically identify potential issues of concern for advanced (nano) materials (p35).

Apologies to those not mentioned due to lack of space!

Every contribution is enormously appreciated, so please keep them coming. We hope you enjoy this issue. Please feel free to share among your networks.

Take care and stay safe

Best wishes

Lesley Tobin

news@nanosafetycluster.eu



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ABOUT THE NANOSAFETY CLUSTER

The next NSC Newsletter will be published in mid-April

Please send in your news, project updates, opinions, events, publications, resources, jobs and opportunities by **31st March 2022**

- [Submit your news here](#)
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- [Find ways to connect with the NSC here](#)



News from the NSC Coordination Team

The Covid-related restrictions are still not over, keeping us busy in ways we never experienced before. For example, focusing on overcoming the challenge of feeling isolated and ensuring that we stay united. This is not an easy task as, by and large, our only option when it comes to getting together has been through online events – and we all know it's not the same! Although timewise these can be very efficient, they do not allow social talk and bilateral communication.

As a coordination team we do our best to overcome that and create opportunities for regular engagement within our community, for example by arranging project overarching activities. We have also been maintaining meetings with Working Group Leaders and Project Coordinators, and we are in close contact with the Project Officers at the European Commission's, DG Research and Innovation, whom we continue to support with providing scientific underpinning for keeping nanomaterials (or any other name that is currently being used such as smart or advanced materials) as a topic on the list of DG R&I.

Many of you may have seen the survey in support of the Commission's services work on the preparation of a **"Strategic Research and Innovation Plan for Chemicals in the Green Deal Era" (SRIP)** in which the NSC was also asked to provide their input and suggestions. We would like to thank you very much for your valuable contributions to the preparation of the NSC-input to the SRIP. Please also be ready to comment during the envisaged consultation phase – we will inform you about it, as soon as the EC has launched this.

As mentioned above, terminology is changing, perhaps in part as a marketing strategy, or simply because materials are becoming more complex and there is a need for the name to reflect that. This also raises the question of whether new definitions have to be formulated (in the context of regulatory frameworks) or whether we should stay away from that and focus more on the functionality in relation to the safety aspects.

In this context, we would also want to draw your attention to **two vision papers**. One is on Nanotechnology for a Sustainable Future (doi.org/10.1021/acsnano.1c10919), in which the many opportunities for nanotechnology are presented as well as the need for Safe by Design and sustainability issues. The paper concludes that there are still gaps in our understanding of the consequences of nanotechnology on human health and the environment. So there is still work to be done by the NSC-community! The authors support working together - a multisectoral approach critical for meaningful impact for society, which is exactly what we, as NSC, stand for.

Another paper addresses the question of what the future holds for the safety and sustainability of advanced materials (doi.org/10.1016/j.nantod.2021.101364). This paper argues that as we need to understand and then regulate an ever expanding list of functionalities in the materials of the future, the nanosafety community is best placed to lead the work. The paper goes on to provide suggestions on how to develop a framework for these new families of materials, which capitalizes on the community's expertise and, through international consensus, will drive the expansion towards new smart/advanced materials.

Spring time heralds several important activities for and with the NSC-community, with several project meetings and workshops coming up that will be promoted via the dissemination group along with the Cluster's channels. We would like to highlight some that we see as highly relevant for our community: The EC is celebrating the **2nd Safe and Sustainable by Design Stakeholder Workshop**, scheduled to take place on 22nd March 2022, online. The aim is to present the draft methodology to define SSbD criteria for chemicals and materials. More information will be made available soon.

Along with several EC-funded NanoSafety projects, [the NanoCommons project](#) is running **NanoWeek 2022**, hopefully a physical event in Limassol, Cyprus. This NSC-community event will tackle the theme "Evolution of Nanosafety and materials sustainability as we transition into Horizon Europe". The conference and associated events (e.g., Young NanoSafety Researchers' event, Training events, EU-US CoRs meeting, NanoInChi meeting, NSC meeting) will take place between 20 – 24 June 2022.

In the meantime, stay safe, healthy, and see you soon – hopefully physically during the Nanoweek,
Andreas Falk, Flemming Cassee and Éva Valsami-Jones

CT@nanosafetycluster.eu

The NanoSafety Cluster Working Groups report:

Updates from the Working Groups will be included in the next NSC Newsletter. WGA news has been incorporated in the NanoCommons updates later in this issue. Meanwhile, here is news from WGB:

WGB Materials & Standards: Chair and Co-Chair: Miguel A. Bañares, Georges Favre

WGB recently shared some information from the ISO Technical Committee 229 Nanotechnologies on the '**Advanced Emergent Material**' topic.

In order to facilitate interactions between the different stakeholders in terms of innovation, assessment of associated risks and regulatory preparedness, ISO Technical Committee 229 Nanotechnologies has formed an study group on advanced and emergent materials to help identify and resolve (where appropriate) terminology issues involving innovations related to nanotechnologies.

As part of this effort the study group is seeking input from internal and external stakeholders, and subject matter experts to ensure that any term considered for development adequately addresses the broader communities. For awareness, the following are the original terms of reference for the Study Group:

- Evaluate the need for terminology surrounding advanced and emerging materials dealing with nanotechnology.
- Evaluate the need for additional terms to clarify differences between variations in the use of terms related to advanced materials.
- Discuss with other TC/229 working groups to identify needs in terminology and liaise with other relevant organizations as needed.

As with all efforts in ISO the overarching purpose is to facilitate international trade by providing common standards between nations. Based on concerns drawn in this group and in other groups dealing with advanced materials a broader set of terminology is likely required to clarify communications across material innovations.

The survey below issued by the study group is intended to help facilitate discussions in the upcoming TC229 Plenary Meetings.

https://forms.office.com/pages/responsepage.aspx?id=IP-naC-BOEeQ6gsQUYRvdOw-Vfqs1wpHpF_QAMxMfB5UMEpSMotJNUIHTUE4NkE3Ro1YUE5XMDhYTy4u

You can receive regular updates directly to your inbox:

Join any or all of the [Working Group Mailing Lists](#)

Find out more about each Working Group:

- [Working Group A – Communication, Training and Education](#)
- [Working Group B – Materials and Standards](#)
- [Working Group C – Exposure and Hazard Assessment](#)
- [Working Group D – Models and Tools for Risk Assessment](#)
- [Working Group E – Innovation and Safer by Design](#)
- [Working Group F – Data Management](#)
- [Working Group G – Regulations and Risk Governance](#)



Communicating about Nanomaterials—a Joint NIA & NSC Webinar



The Nanotechnology Industries Association (NIA) and EU Nanosafety Cluster (NSC) recently held a webinar on Communicating About Nanomaterials. The event brought together speakers from the NIA, the UK Science Media Centre, US-based Cerion Nanomaterials, and speakers from three Horizon 2020-funded projects on risk governance in nanotechnology, NANORIGO, RiskGone, and Gov4Nano.

The webinar was held to discuss how and why nanomaterials are sometimes misrepresented in the media and how this can have a negative impact on the sector. Opening the webinar, the NIA Director General Chiara Venturini gave a brief overview about the topic and why it needs to be covered at this time. Hannah Taylor Lewis from the UK Science Media Centre discussed their focus of helping scientists become better at working with the media and ensuring that science stories are accurately reported, and that the public are better informed of the work of scientists and its impact on society.

Tracy Gay from the US company Cerion Nanomaterials gave a company perspective on communicating around nanomaterials and talked about ways companies can ensure an effective communications strategy, and the importance of doing so. This was followed by a presentation from three of the Horizon 2020-funded projects on risk governance. After a presentation from Marie-Valentine Florin (International Risk Governance Center) and Professor Rob Aitken (IOM) about the EU Nano Risk Governance House concept that has been developed by the three projects, there was an opportunity for the audience to participate in a short survey gathering information on perceptions of risk governance and risk communication. Finally, Mikko Rissanen from Dialog Basis presented some results from Gov4Nano on the current trends for public communication of nanomaterials.

The webinar is a useful starting point for all researchers and companies interested in effective communication of their nanomaterial research and products. It highlighted some of the potential pitfalls, such as having a research outcome sensationalised, as well as some guidelines to help improve how to communicate about complex scientific and technical subjects. The development of new approaches to governance for nanomaterials is one initiative that could be used across the sector to create a collective way of improving communications with all stakeholders and especially in connecting with citizens, who are the eventual end-users of nanomaterials.

The webinar is available for people to watch or revisit on [the NIA YouTube channel](#).

Gov4Nano, NANORIGO and RiskGONE have all received funding from the European Union's Horizon 2020 Research and Innovation Programme Under Grant Agreements 814401, 814530 and 814425 respectively.

BIORIMA's Final Public Event Results, Reflections and Aspirations

Video link: <https://youtu.be/gorO3MQguoY>

A large audience of wide-ranging stakeholders logged on to take part in BIORIMA's final public event, held on January 19th, 2022.

Organised with polished efficiency by Lisa Bregoli and Stefania Melandri, Warrant Hub, the event comprised three distinct and engaging sessions:

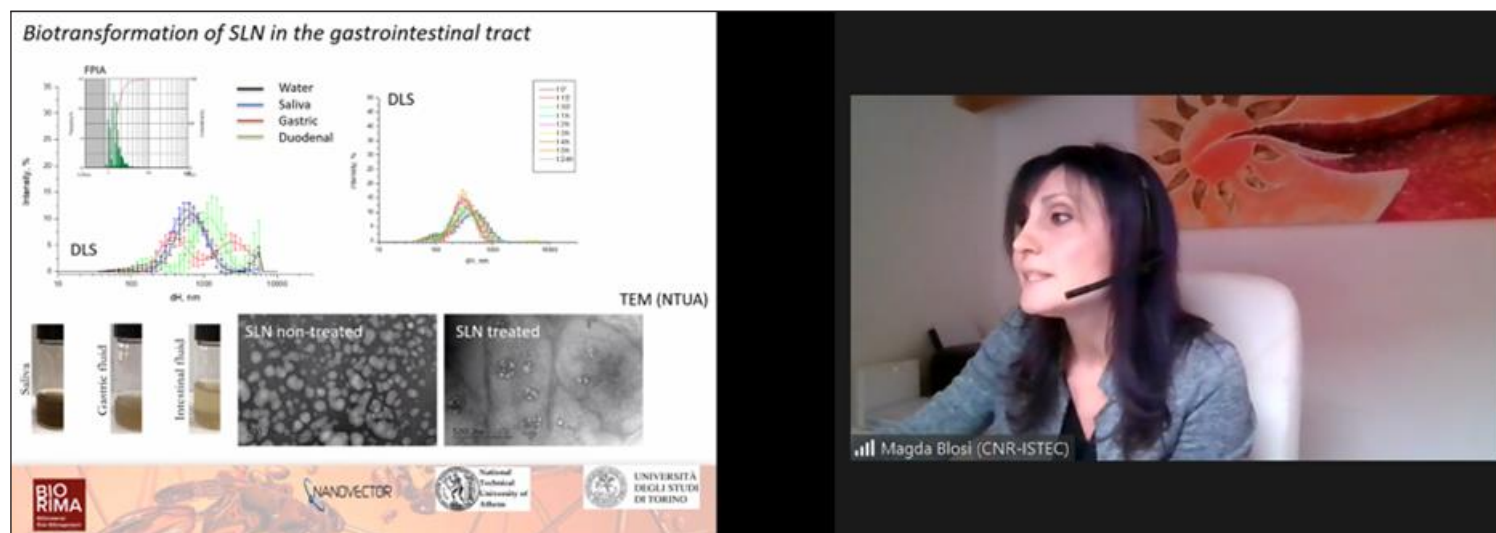
1. Presentation of BIORIMA Final Results
2. Nanosafety projects response to real-world needs
3. NSC-community-activity "Brainstorming of future collaboration for nanobiomaterials risk assessment"

1. Presentation of BIORIMA Final Results

With a full morning dedicated to focusing on technical outcomes of the project and its case studies, Lang Tran (IOM) (right), the BIORIMA Project Coordinator, launched the event to welcome everyone and introduce the proceedings.



The first presenter, Magda Blosi (CNR-ISTEC) (below), then took to the virtual platform to present highlights of BIORIMA's final results and achievements of WP2's materials studies. Magda mentioned that from this WP, representative and extensively characterised nanobiomaterials (NBMs) have been provided; it has supported the standardisation of NBM production methods; it has advanced and improved the current testing procedures on the new class of NBMs; provided wide-ranging characterisation in support of risk assessment; build SbD alternatives on NBMs, and promoted the development of new eco(tox) key-descriptors for the considered NBMs.



In the next presentation, the outcomes from the WP3 exposure studies were delivered by Bernd Nowack (EMPA) (next page), in which he highlighted that this WP has identified release and exposure scenarios for NBMs; performed the characterization of NBM release from materials; developed methods for evaluating NBM release from implants, modelled the environmental release and exposure of NBMs; and finally developed and applied exposure and biomonitoring systems in real situations, among other achievements.

[Cnld →](#)

Towards Standardization

- CEN Workshop Agreement CWA 17253-1. Joint implants - Part 1: Novel methods for isolating wear particles from joint replacements and related devices.
- CEN Workshop Agreement CWA 17253-2. Joint implants - Part 2: Tiered toolkit approach to evaluate the biological impact of wear particles from joint replacements and related devices.



Bengt Fadeel (Karolinska Institutet) and Janeck Scott-Fordsmand (Aarhus University) followed in a presentation of the WP₄ outcomes from hazard studies (right).

This WP sought to develop reliable and robust test methods for identification of potential adverse health effects of nanobiomaterial (NBM) enabled medical devices (MDs) and advanced therapy medicinal products (ATMPs) and to evaluate schemes to assess the potential environmental effects of NBMs.

It was concluded that WP₄ has generated a wealth of data in relation to the hazard assessment of these materials using a range of *in vitro* and *in vivo* model systems relevant for human health that the environment.

The Standard Operating Procedures (SOPs) and collected data are available for other users. Based on this work, modifications to existing test guidelines are suggested, and selected tests may be developed into standards, pending further validation through ISO/CEN.

Meanwhile, Janeck Scott-Fordsmand (above) emphasised how the test systems have been evaluated in terms of compliance with OECD test guidelines as well as focusing on sustainability.

A short coffee break was taken, before the meeting resumed with WP₅ speakers - Danail Hristozov, Alex Zabeo, and Virginia Cazzagon (Greendecision Srl) – who gave the audience a valuable insight into the workings of the BIORIMA Decision Support System (DSS) for risk assessment and management of NBMs. The DSS aims at supporting stakeholders in the assessment and management of occupational and environmental risks of NBMs used in medical applications. The DSS is the software implementation of the BIORIMA Risk Management Framework.

Outcomes

- Overall, WP₄ partners have generated a wealth of data with respect to hazard assessment of "benchmark" nanomaterials and nanobiomaterials using a range of *in vitro* and *in vivo* model systems relevant for human health and the environment. The SOPs and the data collected are available for other users. Based on this work, modifications to existing test guidelines are suggested, and selected tests may be developed into standards pending further validation through ISO/CEN.



Developed adaptations/extensions of current OECD guidelines with focus on sustainability

Complex higher tier test design simulating environmental fate and effects: OECD 303A (simulation of wastewater treatment) as basis for ecotoxicological tests with bioassays (ISO 15685, Microtox®), microbial genomic diversity, OECD TO 220, 232, 317) and effluent (fish cell lines, OECD TO 202, 211).



Cntd → [BIORIMA's Final Public Event—Results, Reflections and Aspirations](#)

BIORIMA Decision Support System (DSS)

The **BIORIMA DSS** aims at supporting stakeholders (industry, regulators, consultants) in the assessment and management of occupational and environmental risks of nano/biomaterials (NBMs) used in medical applications

The DSS is the software implementation of the BIORIMA Risk Management Framework and includes:

- ✓ Tiered IATA to facilitate hazard identification and guide the user in cost-effectively acquiring physicochemical and hazard data for risk assessment
- ✓ Models for dose-response as well as occupational and environmental fate/ exposure assessment of NBMs along their life cycles
- ✓ Models for quantitative (deterministic and probabilistic) human health and environmental risk assessment, including uncertainty analysis
- ✓ Guidance to selecting suitable Risk Management Measures, providing also information about the efficacy of these measures and the cost of their implementation

Danail Hristozov (GD)

Alex Zabeo (below) took over with a hands-on demonstration of the system itself, taking the audience through use-case scenarios in a journey that displayed the user-friendliness of the system and its attractive interface.

Alex Zabeo (GD)

Virginia Cazzegon (above) complemented this by taking the audience through an occupational risk assessment of magnetite NPs used as contrast agent in MRI applications using the BIORIMA DSS.

Cntd →

[Cnld →](#) **BIORIMA's Final Public Event—Results, Reflections and Aspirations**

The presentations of the project's final results concluded with WP6 outcomes from case studies, presented by Carlos Fito (ITENE). His overview included a report on the local validation and remote validation case studies involving Key Performance Indicators (KPIs), direct consultation using tailored surveys, and webinars with voting. Carlos went on to describe how all the different tools and methodologies developed in the BIORIMA project have been captured, transferred, and made available in factsheets produced by Rudolf Reuther (ENAS) that show their applicability, technology readiness levels, compliance with standards where relevant, and related sources. Among the lessons learned from industry, Carlos highlighted the barriers that need to be surmounted within industry and how the BIORIMA project outcomes can help achieve this.

Summary Conclusions

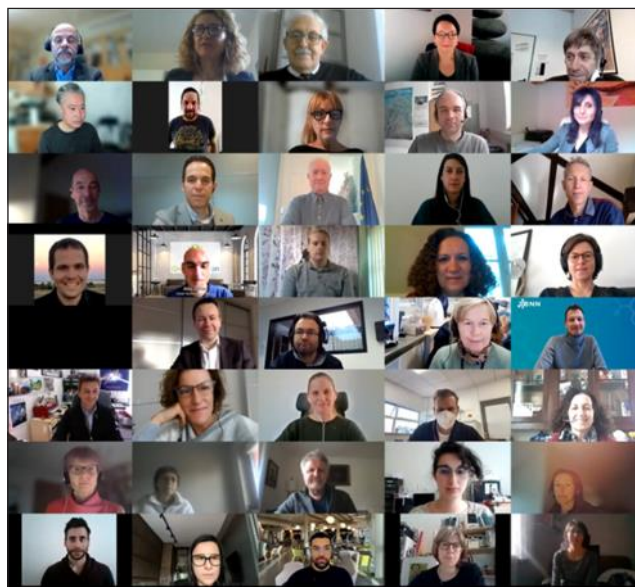


- A **science-based guidance / tools** is offered to those stakeholders that deal with risk issues related to NBM, especially when used in various medical applications,
- A **comprehensive framework of newly tested methods** has been created by BIORIMA that allows practitioners (risk assessors in companies and public bodies, health care professionals) to address nano-specific risks that have not been taken into account so far, but will achieve increasingly stronger attention due to newly introduced EU regulations,
- BIORIMA **facilitates and improves the performance of current risk assessment and management schemes** in the nanomedicine sector,
- A **clear impact on the nanomedicine supply chain** was observed, ranging from NBMs producers to health care related workers



The floor was then given to Marcello Cacace to comment on his impressions of the project and the partners' work over the past four years. Among his observations, Marcello stated:

"I was impressed by the fact that each work package performed in my opinion very well. The picture that one can gather is overarching and covered the principal issues of nm risk. It should be emphasised that the results are there and are available to the scientific community. This is important. It is very important that the results and the framework you provide are brought to the attention of stakeholders and government. A sincere congratulations to all of you."



Session II

Nanosafety projects response to real-world needs

When BIORIMA kicked-off over four years ago, no-one predicted that the world would succumb to a pandemic in the way that it has.

Despite lockdown constraints, the BIORIMA project responded quickly and addressed key issues by forming an expert Task Force, whose work was the focus of the next session: **COVID-19 Task Force of BIORIMA: Addressing the Needs of the Pandemic**, chaired by Bengt Fadeel (Karolinska Institutet) and Lang Tran (Institute of Occupational Medicine).

[Cnld →](#)

Session II Nanosafety projects response to real-world needs

Following an introduction to the topic, Bengt's presentation, 'From nanosafety research to vaccines', demonstrated how nanomaterials have an important part to play in PPE, facemasks and so forth, surface coatings, and of course in mRNA vaccines. Emphasising that vaccines are indeed the way forward, Bengt proceeded to deliver a highly informative talk that summarised all the vaccines that are currently being applied.

Next, in her presentation "Silver nanoparticles as a potential anti-viral agent", Anna Costa (CNR- ISTE) (right) described how the COVID-19 Task Force emerged from the needs of the pandemic and outlined its endeavours to reduce exposure and hazard. Anna looked at what is required of anti-viral technologies, including low-cost and green ingredients, ease of scalability, ease of applicability, high stability, and circularity, as well as considering significant safety aspects.

During lockdown, ISTE worked on these requirements as part of a joint effort with the ongoing SbyD initiative, ASINA, and showed how this research may continue.

In discussing 'Pegylated lipid nanoparticles: making vaccines safe', Terry Wilkins (University of Leeds) (above right) commenced with an overview of his role in the COVID-19 Task Force, including reducing hazards and risks of pseudo anaphylaxis for mRNA vaccines encapsulated in PEGylated liposomes; examining if this knowledge can be usefully applied to BIORIMA's research in PEG; PEG-PLGA and solid-lipid nanoparticles in nanomedicine; and guiding future development in these areas. An in-depth review was conducted in collaboration with Marco Monopoli (RCSI Royal College of Surgeons, Ireland) from which it emerged that there is a need for discussions with Clinical Immunologists to assess if further work is required, and that BIORIMA's SbyD methods could be used to design better vaccine nanocapsules.

NANO-SILVER TECHNOLOGY

DISINFECTION

ATMP

PPE

MD

Ag

PREVENTION

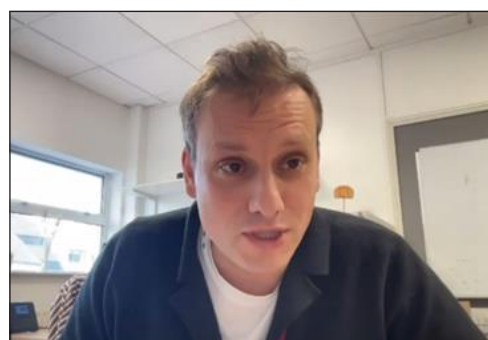
Benefits & Risks of PEGylated Liposome mRNA Covid 19 Vaccines
Pfizer/BioNTech (BNT162b2) and Moderna (mRNA-1273)

Benefits

- 8 billion people have been vaccinated with these vaccines.
- They are effective against all known variants observed so far.
- 2 or more doses have substantially reduced global morbidity and deaths
- 90nm PEGylated liposome nanocapsules are used to deliver the mRNA vaccine. These have been actively studied for pharmacological use for ~15 years (e.g. Doxil and siRNA for cancer treatment)
- The mRNA active ingredient can be easily updated to combat new variants

Risks

- 2.5 to 4.7 per million vaccinated subjects have experienced life-threatening anaphylaxis - Complement Activation-Related Pseudo-Anaphylaxis (CARPA)
- There may be longer term risks?



Continuing the theme, and standing on the shoulders of Charles Darwin, Janeck Scott-Fordsmand (Aarhus University), in his presentation on 'Environmental perspectives on COVID-19', concluded that invertebrates have mechanisms to handle viruses; they have Angiotensin-Converting Enzyme (ACE) activation mechanisms; and certain NBMs cause the activation of ACE. Studies on invertebrates, such as [the earthworm study](#) that Janeck highlighted, continue to inform us about human biological responses.



During the Round Table discussions that followed, Marco Monopoli (RCSI) (left, top) mentioned his closely related work in the [NanoCarb project](#), while Miguel Banares (CSIC) (right bottom) discussed his work on minimising exposure using thermal catalytic filters and ongoing work at the Hong Kong University of Science and Technology on photocatalytic filters.

The Round Table stimulated a significant degree of discussion that sadly had to be curtailed due to time constraints. Lang concluded by thanking everybody in the audience for their participation and, particularly for their efforts in the fight against COVID.

Session III

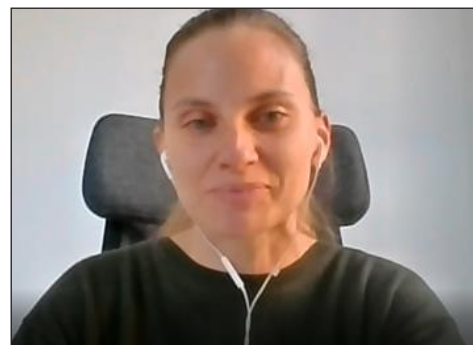
Brainstorming of future collaboration for nanobiomaterials risk assessment

In the final session of the event, **NSC-community-activity “Brainstorming of future collaboration for nanobiomaterials risk assessment”**, the NanoSafety Cluster took the lead under the aegis of BNN (BioNanoNet Forschungsgesellschaft mbH) representatives Andreas Falk and Susanne Resch (right), who tag-teamed in a prominent session that, as Lang explained, was designed to inform future EC calls through the voice of the NSC.

Using Mural software, participants took part in a brainstorm to find out what expertise there is available in the immediate community and what participants can 'bring to the table' to address nanosafety issues as well as ongoing and future challenges, including the current pandemic.

Andreas presented the following points to be addressed, urging the audience to envision what they may be working on in time to come:

- Who is who
- Collaboration offer – what is my expertise?
- Collaboration topics – research needs and future trends
- Public communication on the safety of NBMs: Challenges and potential EU NSC activity.

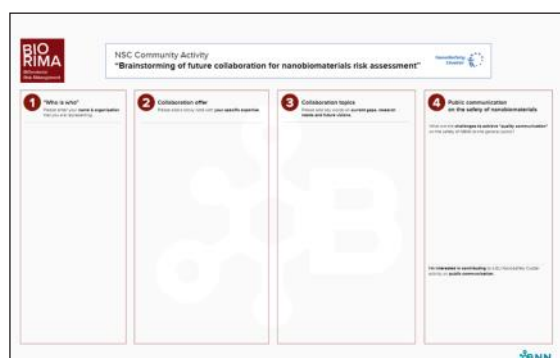


Susanne then guided the 60 participants through the workings of 'MURAL', facilitating what turned out to be a lively session of dynamic activity.

As participants responded to these questions in a flurry of 'post-it' notices on the MURAL virtual whiteboard, Lang emphasised that this was one way in which the BIORIMA partners and stakeholders can constructively come together on the NSC platform and have their voices heard. Addressing a final spontaneous question, audience members expressed their keen interest in contributing to an EU NanoSafety Cluster activity on public communication. Meanwhile, Gary Hutchison (Edinburgh Napier University) (right) added his support for this by mentioning a forthcoming publication based on a Delphi style review by DEFRA's hazardous substances advisory committee in relation to the Green Deal, designed to show what kind of challenges toxicologists and the public will have to face. He stressed that this was a successful precedent of the collaborative public communication activity that had just been proposed.



In the final wrap up, Lang Tran (Institute of Occupational Medicine) stated that the 4.5 years of the BIORIMA project had been a lovely time working together, adding: “Although we couldn't meet in person, we'll just have to work harder to make it happen”. He expressed his thanks to everyone and especially to Marcelo Cacace, and his absolute pride in what everyone had achieved.



The MURAL whiteboard is shown here (left) with the responses on the next page...

Cntd → BIORIMA's Final Public Event—Results, Reflections and Aspirations

Session III Brainstorming of future collaboration for nanobiomaterials risk assessment

BIORIMA Final Public Event 00:56 left Facilitator All changes saved! 1 Share

There is only 1 minute left. Want to add extra time? x

BIO RIMA BiOMaterial Risk Management

NSC Community Activity
"Brainstorming of future collaboration for nanobiomaterials risk assessment"

1 "Who is who?"
Please enter your name & organisation that you are representing.

2 Collaboration offer
Please add a sticky note with your specific expertise.

3 Collaboration topics
Please add key words on current gaps, research needs and future visions.

4 Public communication on the safety of nanobiomaterials
What are the challenges to achieve "quality communication" on the safety of NBMs to the general public?

I'm interested in contributing to a EU NanoSafety Cluster activity on public communication.

Visiting Fish: Sergio Linares (Visiting Fish)
Visiting Crab: Lesley Tobin (Visiting Bird)
Visiting Crab: Ivana Fenoglio (Visiting Ram)
Visiting Snail: Rudolf Reuther ENAS (Visiting Ram)
Visiting Spider: Panos (NTUA) (Visiting Spider)
Visiting Shark: Burkhard Stahlmecke (IUTA) (Visiting Shark)
Visiting Raccoon: Magda Blosi (Visiting Raccoon)

ML Fernández (Visiting Sea Lion)
Visiting Crab: ...
Visiting Sea Lion: ...

What are the challenges to achieve "quality communication" on the safety of NBMs to the general public?

Use interested in contributing to a EU NanoSafety Cluster activity on public communication.

BNN

The MURAL in action (above) and participants' responses (below)

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The SbD4Nano Project shares its latest achievements

SbD4Nano General Consortium Meeting (November 26, 2021)



SbD4Nano community held their second half-yearly consortium meeting virtually on the 26th of November, 2021. The meeting's agenda enabled the partners to discuss and plan future actions to accomplish the project goals. The event started with an evaluation of the first meeting held in May 2021, and continued with partner presentations and interactive workshops.

The key focus of the presentations was the design strategies related to the materials and processes covering a wide variety of Safe-by-Design approaches. During the meeting, the keenly anticipated demo version of the Safe-by-Design e-infrastructure was also introduced to the SbD4Nano partners (see below).



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](#)

Publications

SbD4Nano publications have contributed to industrial and academic knowledge about Safe-by-Design approaches to the developing nanotechnologies.

[Read more about our publications here!](#)

Events

Our partners have successfully participated in a wide range of events (e.g. conferences, workshops, and forums) over the last year.

[View all our events here!](#)

Forthcoming Event

SbD4Nano is pleased to announce its prospective participation in the **32nd Annual Meeting of SETAC Europe (15-19 May 2022)**.

For more information about the meeting, please click [here](#)

The SUNSHINE Project Shares its Updates

As an industry-oriented project funded by the European Union's HORIZON 2020 research and innovation programme, SUNSHINE continues to develop, promote and implement safe and sustainable innovation in the field of nanotechnology by developing Safe and Sustainable-by-Design strategies. The project partners have been enthusiastically working on building these strategies and creating applicable solutions for materials and products incorporating advanced multicomponent nanomaterials.



The safety regulations related to the MCNMs

One overarching aim of the SUNSHINE project is to address the [regulatory relevance aspects](#) by analysing the regulatory implications of MCNMs [multicomponent (advanced) nanomaterials] and how these advanced nanomaterials are covered in the legislation.

To this end, the EU legislation related to nanomaterials and the evaluation of existing test guidelines and other standards documents (e.g., OECD, ISO, CEN) concerning the MCNMs information requirements is consulted.

By keeping track of all updates of the legislation, the publication of new guidance documents or the latest scientific literature defining or describing MCNMs, the SUNSHINE project partners carry out their activities in line with the European Green Deal actions [e.g., Circular Economy, Chemicals Strategy for Sustainability (CSS), Zero Pollution Action Plan].



Human hazard and ecotoxicological testing of the advanced materials

Developing Safe and Sustainable-by-Design strategies for multi-component nanomaterials requires a complete characterisation of their physicochemical features. Thus, both human hazard and ecotoxicological testing of several multi-component nanomaterial case studies have been initiated. This first phase of [the ecotoxicity testing](#) includes the assessment of the impact of UV-irradiation on toxicity and the fate dynamics of the particles in the test medium. The main focus of this phase is to evaluate genotoxicity, cytotoxicity and capacity to generate reactive oxygen species following exposure of human cells to the test materials. In the later stages of the project, more chronic and repeated exposures will also be evaluated.

Events & Publications

Consortium members continue to demonstrate their sustained efforts in the project by engaging in events and producing publications: [Click here to view the events](#) | [Click here to view the publications](#)

Defining Safe and Sustainable-by-Design:

Dr. Stella Stoycheva (Yordas Group) and Dr. Lucian Farcas (The European Commission, Joint Research Centre) came together in an open-access webinar to discuss the adoption of Safe and Sustainable-by-Design (SSbD) approaches towards a climate-neutral, circular and resource-efficient economy and a zero pollution/toxic-free environment.

[Go to the free webinar](#)

The new SUNSHINE project brochure

The new brochure offers an overview of the e-infrastructure for safe and sustainable design of advanced materials, specific project objectives, the SUNSHINE concept, sector-specific case studies as well as the project partners.

[Download the brochure](#)

NanoPAT's Status in its 2nd Year

The project is currently running its second year with very promising results so far.

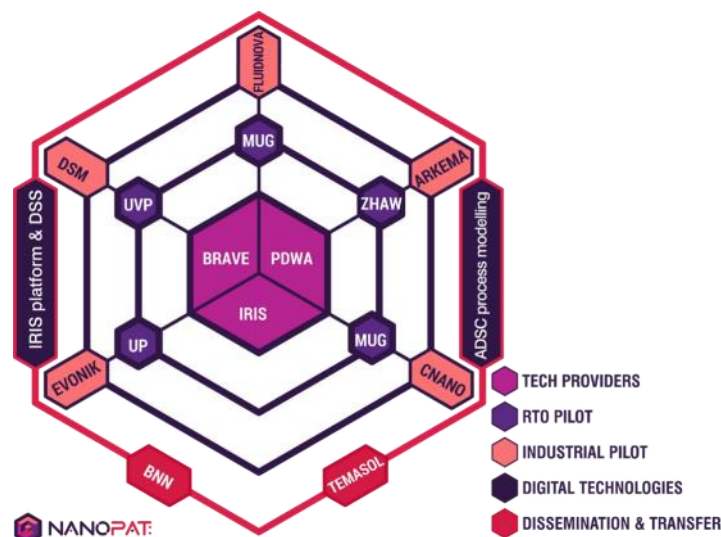
The three monitoring technologies to be developed and validated within the project are getting more and more matured. Over the last months IRIS, PDWA and BRAVE (PAT technology providers) developed their prototypes and at the current stage, a lab scale validation is taking place at UP, ZHAW and UPV (three of the RTO pilots). The nanoparticles to be monitored by them are silica particles, zeolite and polymers, respectively.

Once we have a successful validation in lab scale, then we are going to move into a pilot scale validation. EVONIK, DSM/COVESTRO, ARKEMA, FLUIDINOVA and CNANO are already preparing their pilot lines for hosting the prototypes.

At the same time, a lot of activities are being organized by BNN and TEMASOL towards collaboration with other EU funded projects with similar or supplementary activity. Since the beginning of the NanoPAT project, we appreciate the valuable exchange of ideas with professionals of the industry and, thus, are eager to integrate tools that can help us fulfil the common goal.

Over the next period, BNN is also organizing very interesting events for the dissemination of our results. Several workshops are planned to happen, so stay tuned for more information on this aspect.

Find out more in [the NanoPAT Newsletter](#)



The roles of the NanoPAT partners

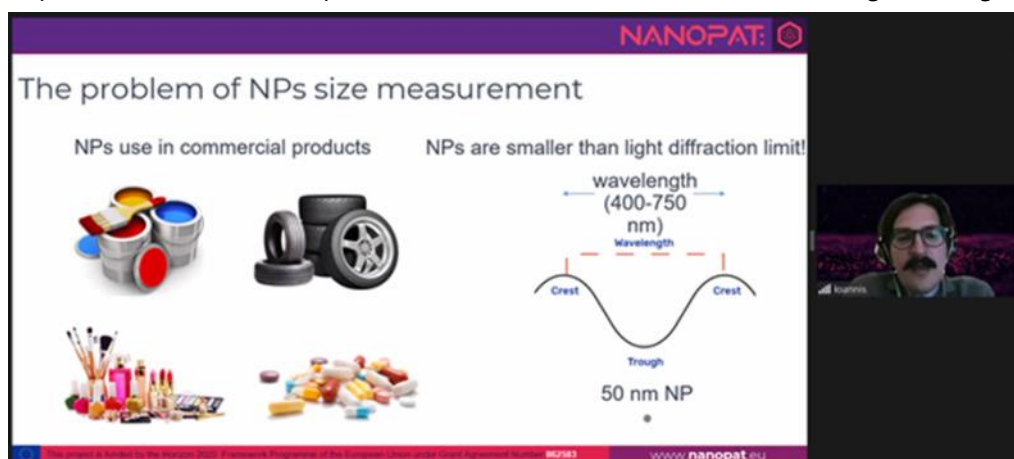
Interactive PAT Workshop at the EuroPACT 2021

Under the title "Online real time characterisation solutions for nanoparticle solution processes", the H2020 project [NanoPAT](#) aims to demonstrate 3 novel real-time nano-characterisation Process Analytical Technologies (PAT) [(1) Photon Density Wave spectroscopy (PDW), (2) OptoFluidic Force Induction (OF2i), (3) Turbidity spectrometry (TUS)], including real-time data handling for digital process monitoring and product quality control. Those will be validated in 5 different industrial ceramic, polymer and mineral nanoparticles manufacturing and converting environments.

Within the framework of the virtual [EuroPACT 2021 conference](#), [NanoPAT](#) organised on **Monday 15th November 2021**, an [online interactive PAT workshop](#) to explain to the community the three novel characterization technologies being developed in the project (PDW, OF2i and TUS) and to live demonstrate them.

The workshop started with the NanoPAT coordinator Ioannis Kakogiannos (IRIS Technology Solutions) (right) briefly presenting the overall activities of the project.

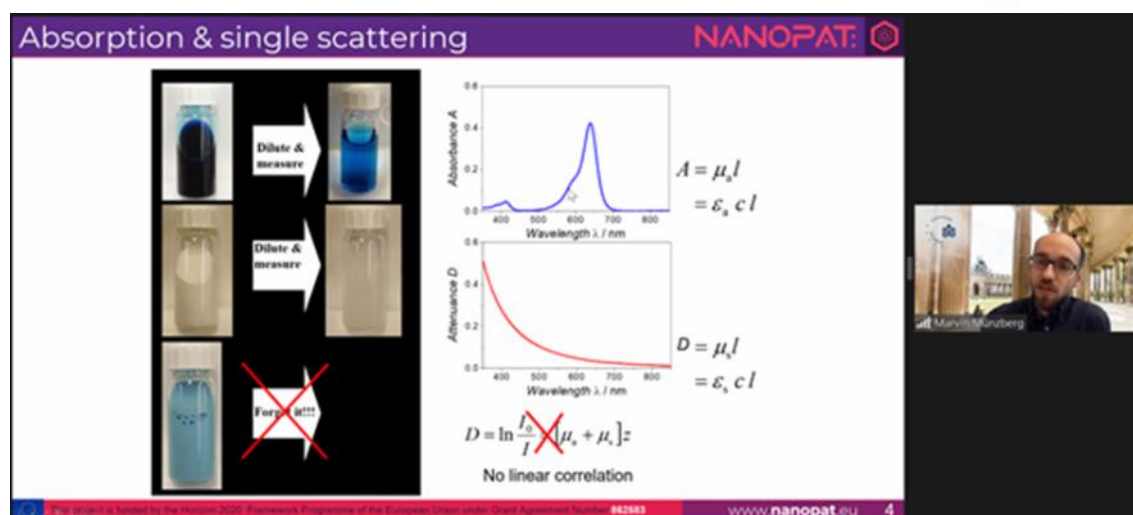
After that, the three PAT experts continued by introducing the technologies.



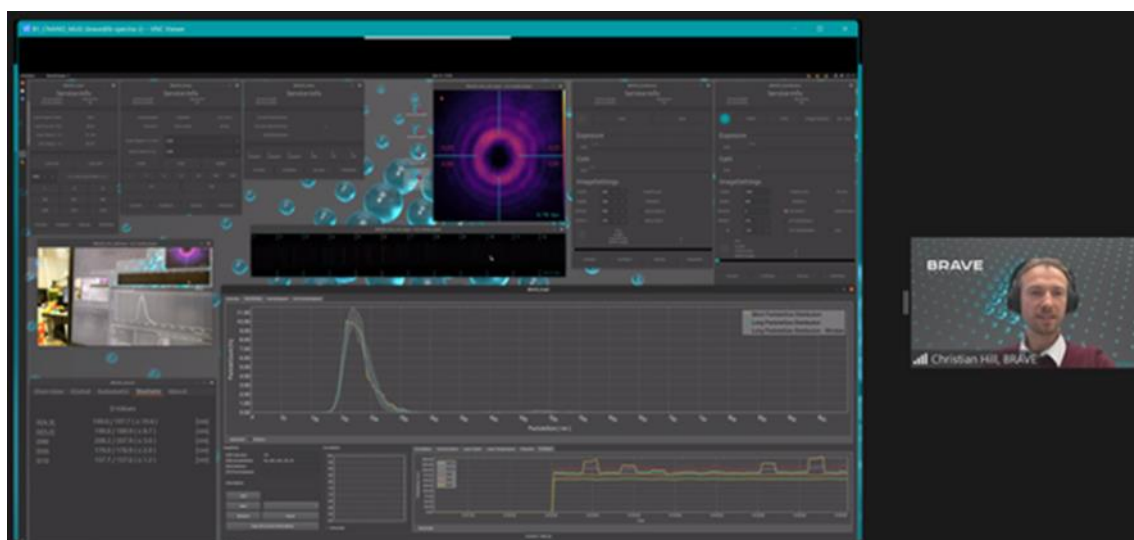
[Cnld →](#)

Cntd → [Interactive PAT Workshop at the EuroPACT 2021](#)

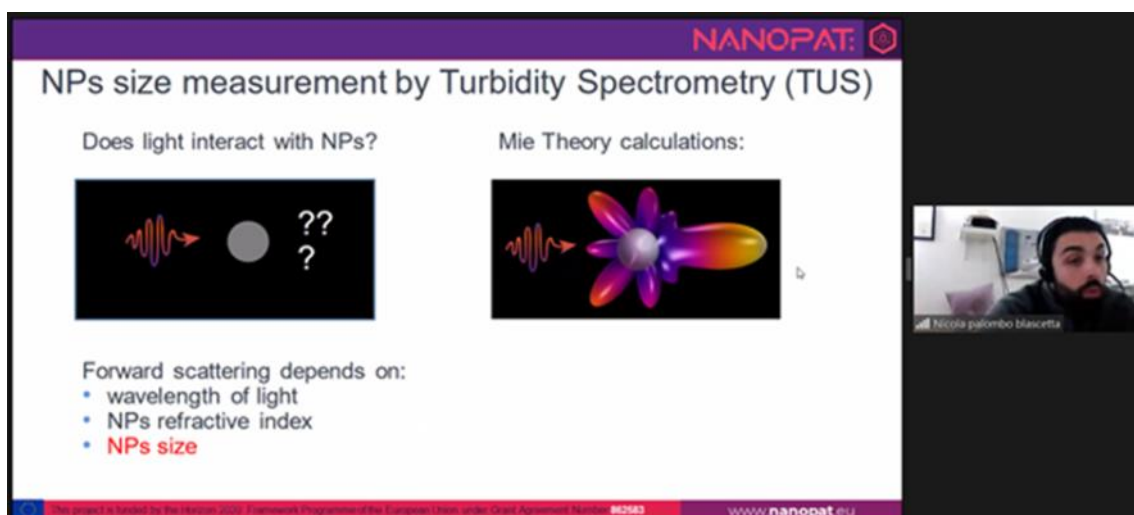
First, Marvin Münzberg (University Potsdam) introduced the fundamentals of the PDW technology to the participants. Afterwards there was a live switch into the laboratory showcasing a real-time analysis of the optical coefficients as well as particle size during a chemical reaction. Furthermore, application examples were shown and discussed by the audience.



Christian Hill (BRAVE Analytics GmbH) presented the OF2i technology to the audience, the use cases where it is being applied. Furthermore, he made a live demonstration of the BRAVE B1 sensor station, showing a real-time online Measurement with the device.



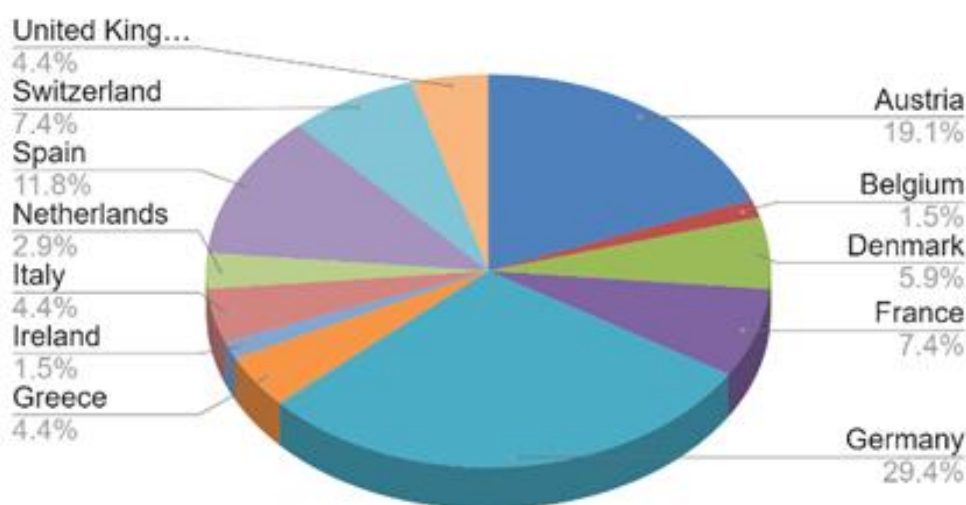
Last but not least, Nicola Palombo (IRIS Technology) explained the basics of nanoparticle size measurement by TUS, how this technology works, its potential and limitations and the case studies where it will be used within the NanoPAT project.



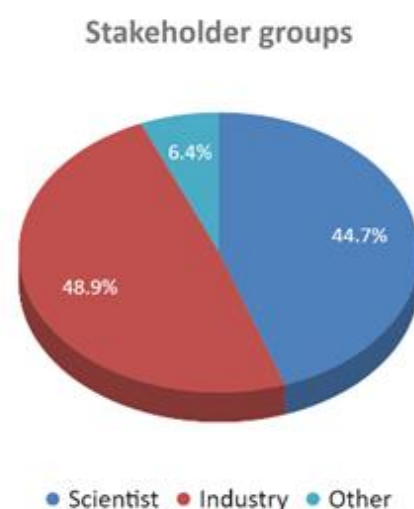
The workshop counted 80 participants, mainly from academia and industry, which were very interested in the new PATs being developed by NanoPAT. It was an introductory workshop to the three novel technologies for a group of stakeholders with limited knowledge on them. The high interest of the participants and the live demonstrations of the PATs gave floor to lively discussions.

Cntd →

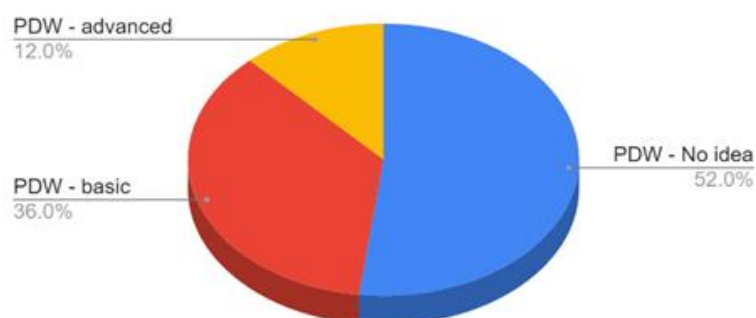
Cntd → Interactive PAT Workshop at the EuroPACT 2021



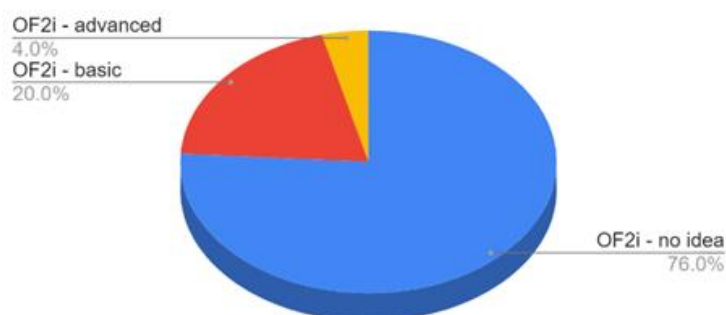
Participants' background



PDW Knowledge of Workshop participants

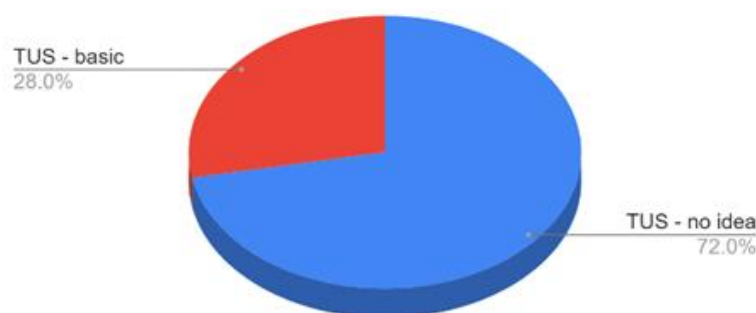


OF2i Knowledge of Workshop participants



PAT knowledge of the workshop participants previous to the workshop

TUS Knowledge of Workshop participants



The workshop presentation slides are available on the [NanoPAT webpage](#), as well as in [Zenodo](#).

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



NanoCommons “Collaborative Research Workshop”

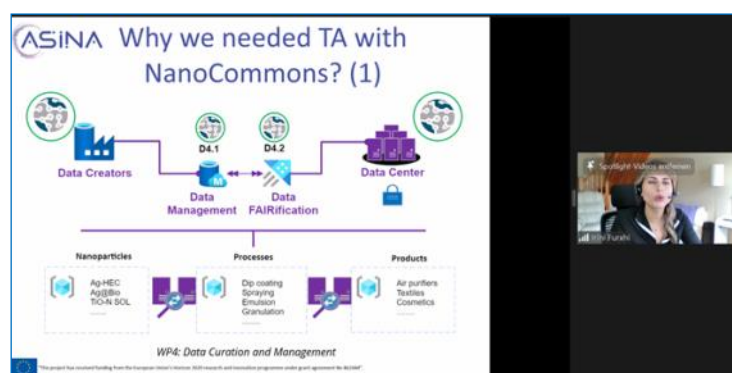
On **Tuesday 9th November 2021**, the H2020 project [NanoCommons](#), in a joint initiative with the EU [NanoSafety Cluster](#) (NSC), organised an *online interactive workshop* to foster collaborative research by trying to bring the nanosafety community together and to work hands-on on establishing ways to make data and software platforms, developed in different projects, talk to each other.



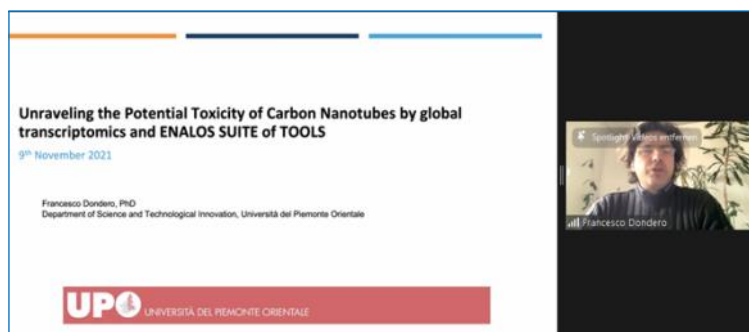
Under the title “**If you want to go far go together - Collaborative research supported by NanoCommons transnational access**”, and after a short introduction of NanoCommons coordinator Iseult Lynch (University of Birmingham), Thomas Exner (7past9) guided the participants through the different presentations. The external speakers (Claus Svendsen, UK CEH - Irini Furxhi, Trangero Ltd - Francesco Dondero, University of Piemonte Orientale - Felice Simeone, National Research Council of Italy) presented their experiences as applicants of Transnational Access (TA) to different NanoCommons Data and Nanoinformatics services.



Claus Svendsen presenting NanoFASE's experience with NanoCommons - Data services TA



Irini Furxhi presenting ASINA's experience with NanoCommons - Data services TA



Francesco Dondero presenting NanoGenTool's experience with NanoCommons - Nanoinformatics services TA



Felice Simeone presenting ASINA's experience with NanoCommons - Nanoinformatics services TA

Furthermore, the internal speakers (Dieter Mayer, Biomax Informatix AG - Haralambos Sarimveis and Philip Doganis, NTUA - Antreas Afantitis, NovaMechanics) gave an overview about Data and Nanoinformatics services used in successful TAs as well as a presentation on Nanoinformatics model development and hosting using the Jaqpot tool.

Thereafter, Thomas Exner explained the support possibilities that NanoCommons offers via its [TAs](#):

1. Knowledge collection and exchange
2. Findability of approaches
3. Data sharing
4. Nanoinformatics tool and platform integration

Finally, Martin Himly (PLUS) presented the new [NanoCommons User Guidance Handbook](#), where it is possible to find the different training materials offered by NanoCommons.

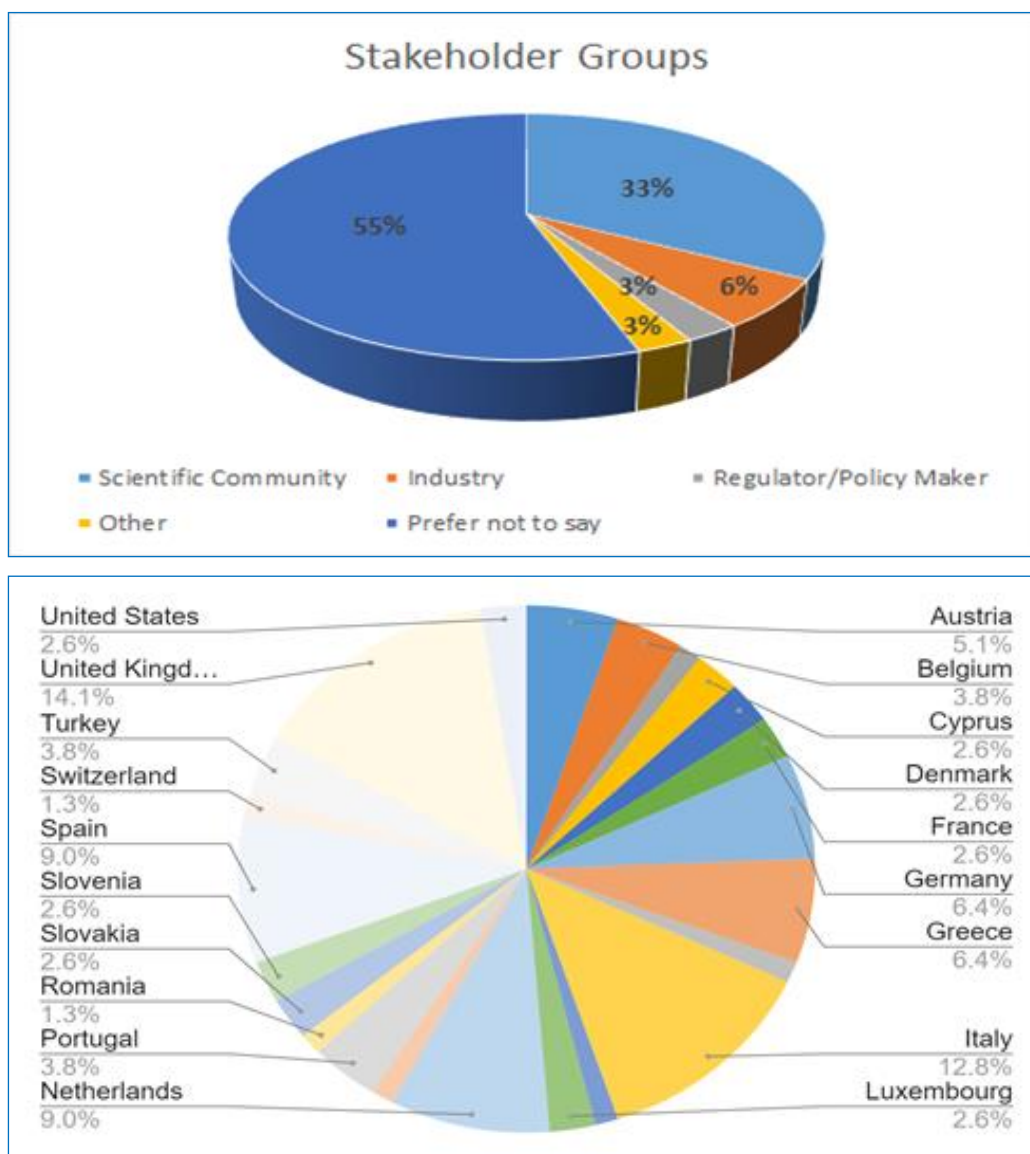
[Cntd →](#)

Cntd → NanoCommons “Collaborative Research Workshop”

Furthermore, Martin announced the [forthcoming events being organised by NanoCommons](#).

The workshop ended with very nice discussions, moderated by Thomas Exner and Iseult Lynch.

It was a very well attended workshop with more than 70 international, active and very interested participants (mainly from academia, but industry and regulators were also present) who communicated their appreciation at the end of the webinar for the high interactivity and the information shared.



The webinar presentation slides and the recording (recorded for educational purposes) are available in [Zenodo](#) and on [YouTube](#).

Thomas Exner (7Pg, Schopfheim, DE, thomas.exner@sevenpastnine.com) is co-coordinator of NanoCommons and leads the NanoCommons work package on *Dissemination and Case Studies*.

Martin Himly (PLUS, Salzburg, AT, martin.himly@sbg.ac.at) takes care of all *Training* issues within NanoCommons and is the chair of the *EU NanoSafety Cluster - Working Group A on Education, Training, and Communication*.

Beatriz Alfaro Serrano (BNN, Graz, AT, beatriz.alfaro@bnn.at) leads the NanoCommons work package on *Integration & Sustainability*.

NanoCommons project has received funding from the European Union's Horizon 2020 programme under grant agreement n° 731032.

Cntd →

“The NanoCommons Knowledge Base: how to find all data for one nanomaterial across multiple data sources”

The H2020 project [NanoCommons](#), in a joint initiative with the [NanoSafety Cluster](#), offered an online demo of the NanoCommons Knowledge Base (NC KB) which was held on Thursday, 2nd December 2021,



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

Webinar Presenters: Dieter Maier, Biomax, Munich, GE; Lee Walker, UKCEH, Wallingford, UK; [Martin Himly](#), PLUS, AT; Christine Balmer, UKCEH, Wallingford, UK; [Thomas Exner](#), Sevenpastnine, Cerknica, SI.

Data retrievals & uploads were showcased using the features of the NC KB (https://ssl.biomax.de/nanocommons/cgi/login_bioxm_portal.cgi) interlinking the results from several large projects' real data sets and corresponding metadata sufficing the need for data FAIRness (Findability, Accessibility, Interoperability, Reusability). Its diverse functionalities were presented in an interactive manner, thus, been tested for fitness-for-purpose by the attendees' demands. Attendees were able to get hands-on experience during this 2 h workshop/hackathon.

Links to the materials (*i.e.* slides sets and recording of the presentations and online demos), ready for download, are available [here](#) as well as from a number of other sources as displayed below:

ns - Knowledge Base Data Workshop by Dieter Maier 02 December 2021

User Guidance Handbook @ www.nanocommons.eu

- ▶ <https://www.nanocommons.eu/e-infrastructure/user-guidance-handbook/>

Training events and materials @ NanoCommons Infrastructure

- ▶ <https://infrastructure.nanocommons.eu/events/>
 - ☞ NSC Education Day Session 1
 - ☞ SmartNanoTox Final Conference

NanoCommons @ ELIXIR TeSS

- ▶ https://tess.elixir-europe.org/content_providers/nanocommons#events

NanoCommons community @ Zenodo

- ▶ <https://zenodo.org/communities/nanocommons>

NanoCommons Channel @ YouTube

- ▶ <https://www.youtube.com/channel/UCuawpRvXNpqlwyetteTctw>

mailing list of WG-A Education, Training, Communication

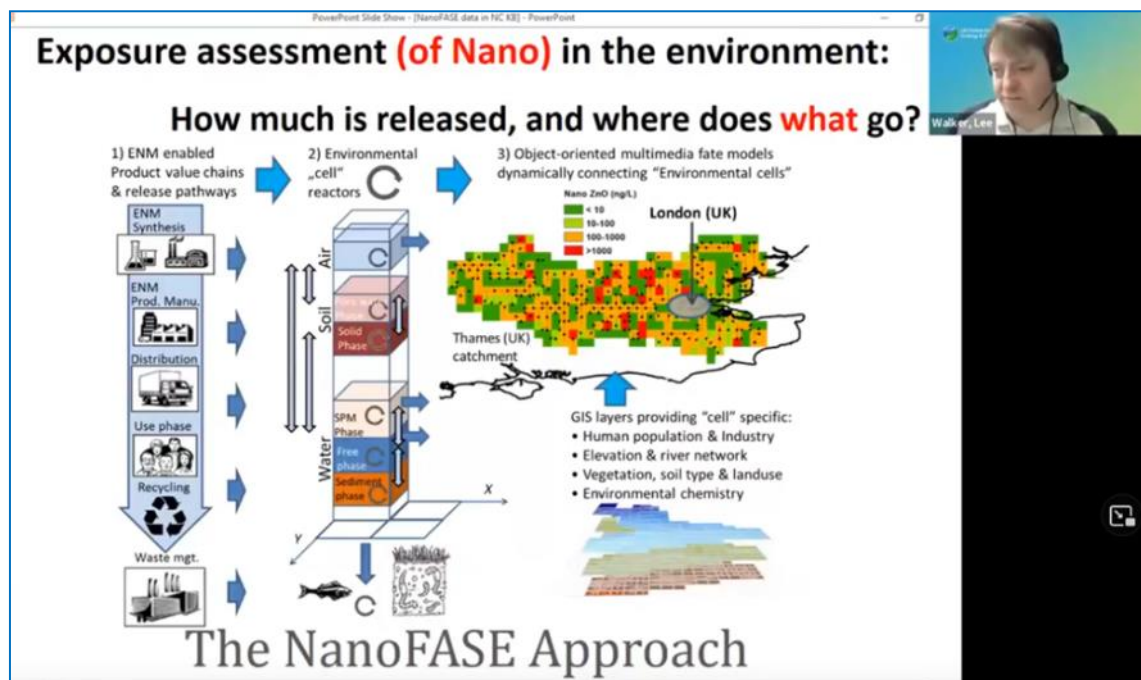
Martin Himly
Nano-Knowledge Community

After a short intro to the different features of the NC KB by Dieter Maier from Biomax, data retrieval/upload was shown in an online demo inside the NC KB, and issues regarding data and metadata completeness were discussed.

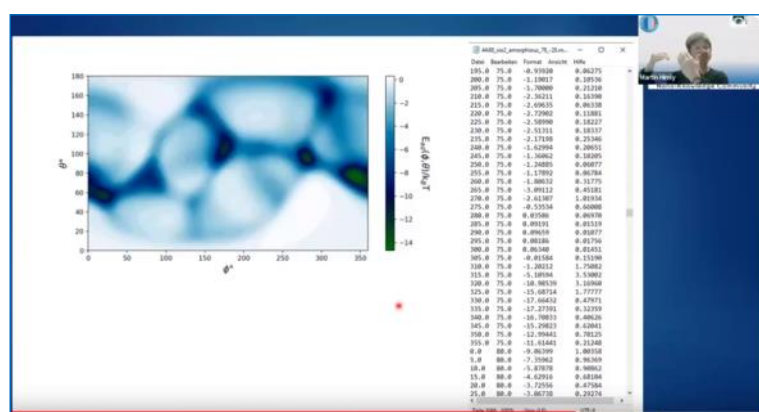
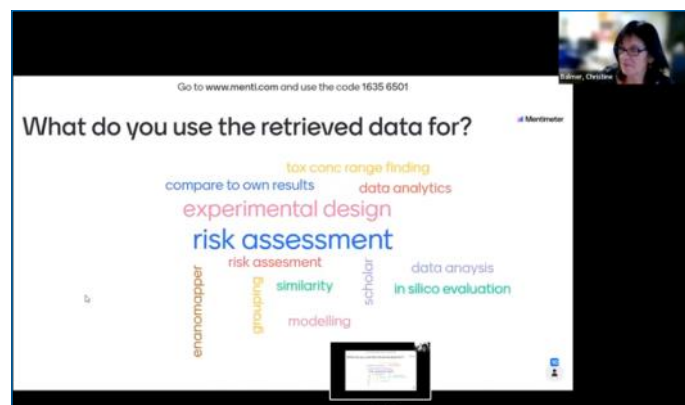
Cntd →

Cntd → The NanoCommons Knowledge Base: how to find all data for one nanomaterial across multiple data sources"

Lee Walker from UKCEH then overviewed the process executed by the recently finished NanoFASE project in collaboration with the NC KB for their large-scale data upload (incl. comprehensive metadata)



Meanwhile, the opinions of the attendees were surveyed for potential applications for data re-use, as depicted below when Christine Balmer from UKCEH was running the poll (below left). Thereafter, useful *in silico* tools being directly accessible from the NC KB were displayed, first the protein corona modelling tool (below right)



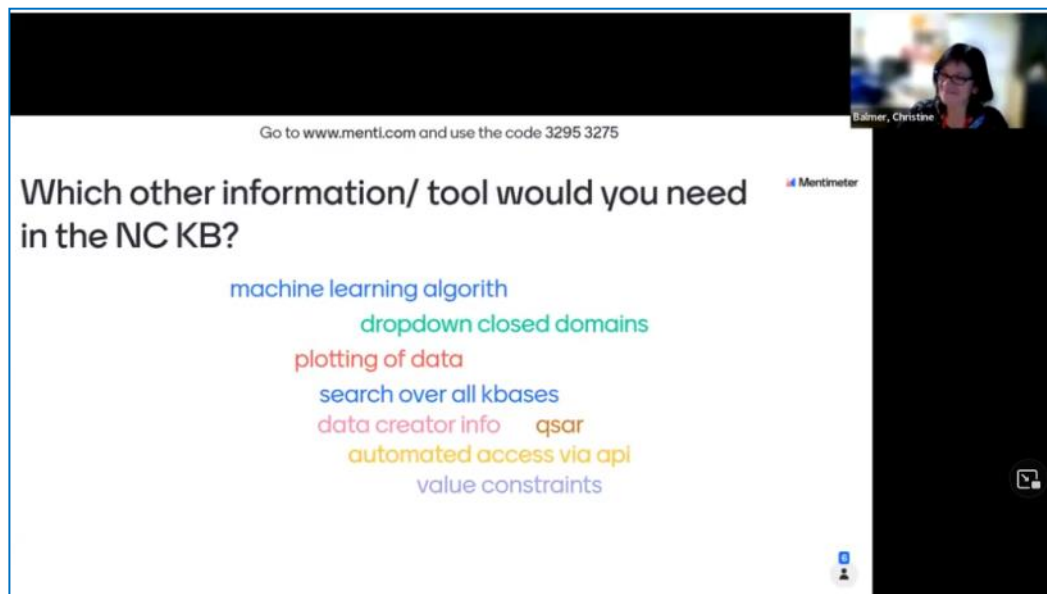
...and later the NanoXtract TEM image analysis tool:



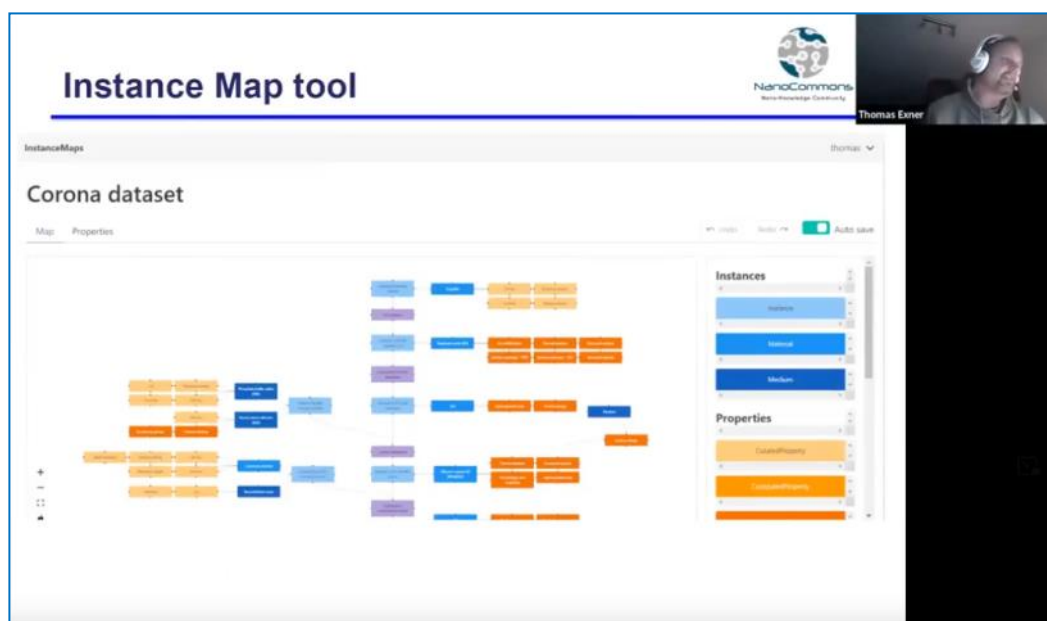
Cntd →

Cntd → The NanoCommons Knowledge Base: how to find all data for one nanomaterial across multiple data sources"

Again, the attendees' opinions were surveyed for their wishes, some of which have been implemented already and a few represent future work:



Towards the end of the workshop Thomas Exner introduced the NanoCommons-powered instance map design tool, for which currently biweekly training/developing(co-creation online sessions are running (when interested sign up at: info@nanocommons.eu):



Interactivity was high as break-out rooms were available for the attendees for some time to more closely looking into (i) large-scale data upload as executed by NanoFASE, (ii) protein corona modelling, or (iii) certain specificities for data retrieval issues. It was a well-attended webinar, with active and very interested participants, who communicated their appreciation during and at the end of the hackathon in form of Q&A, where the respective experts provided further details and insights.

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

Martin Himly (PLUS, Salzburg, AT, 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 Knowledge Base and Electronic Laboratory Notebook Hackathons

The H2020 project [NanoCommons](#), in a joint initiative with the [NanoSafety Cluster](#), offered an online demo on the use of the new features of Electronic Laboratory Notebooks (ELNs) powered through NanoCommons, which took place on Thursday, 13th January 2022.



Under the subtitle, **“Electronic Lab Notebooks - Demo of NanoCommons-powered Features”**, participants were informed that they will learn how to establish a experimental workflows using electronic lab notebooks (ELNs).

Introduction and Host:

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

Webinar Presenter: [Anastasios Papadiamantis](#), UoB, UK

The session started with an introduction to the NanoCommons-powered features on how to manage, modify, create, and import protocols for assays.

Tasks can be defined and assigned to different users and/or groups.

Finally, data (incl. all relevant metadata) can be exported resulting in reports that facilitate data FAIRness.

The two screenshots on the right display the distribution of assays on a typical campus (top) vs. the ELN-captured workflow (bottom):

From a Local Network...

Experimental Workflow

▪ **Multiple-branch experimental workflows**

[Cntd →](#)

Cntd → NanoCommons Knowledge Base and Electronic Laboratory Notebook Hackathons

Technology advancement, the emergence of nanoinformatics and the implementation of FAIR data principles have increased the need for high-quality datasets. To achieve this, the data produced through academia, industry and regulatory bodies needs to be properly curated, to contain sufficient metadata and to be semantically annotated. In this way, data can be accessible and readable from both humans and machines, making it possible to be queried and mined using appropriate systems.

One of the main objectives of NanoCommons is to promote the FAIR data principles, cross-project collaboration and data interoperability. This will make it possible to offer the nanosafety community high quality data that can be combined to produce big datasets and be used in novel modelling, machine learning, deep learning and AI techniques.

We aim to achieve this by implementing data management processes covering the entire data lifecycle, and by moving the data curation process to the data generators, in line with the concept of Data Shepherding. Capturing the data and metadata as they are produced will save substantial time and resources, while resulting in higher quality datasets. ELNs can be implemented, through cloud services or locally, into everyday experimental practice streamlining and simplifying experimental and computational workflows, practices and data capture.

In summary, a number of advantages can be identified for using ELN in your everyday research practice, as depicted below:

Electronic laboratory notebooks



Keep in mind

- ELNs are better than paper notebooks
- ELNs are not a complete data management solution
- ELNs should be part of a data management ecosystem
- ELNs are to be used in conjunction with knowledge bases, semantic annotation etc.
- More work is needed to integrate all the different parts and create a fully functional working environment

It was a well-attended webinar, with active and interested participants who communicated their appreciation during and at the end of the hackathon in form of Q&A, where the respective experts provided further details and insights.

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

Martin Himly (PLUS, Salzburg, AT, 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



LAST CALL for applications for full support from the NanoCommons e-infrastructure is now open!

Closing date 31st March 2022 (project completion by 30th June 2022).

The NanoCommons research infrastructure is designed to provide innovative solutions for data mining, harmonisation, utilisation and re-utilisation, including a range of modelling and decision support tools, provided via an Open Access, federated Knowledge Commons platform. Access to the NanoCommons tools and services is provided to the nanosafety community and its broadest set of stakeholders (enterprise, regulators, insurance and society broadly) via **funded calls for Transnational Access (TA)**.

The **NanoCommons Transnational Access (TA)** provides nanosafety researchers from industry, academia and regulatory bodies access to state-of-the-art NanoCommons expertise **free of charge** and allows users to take advantage of the NanoCommons services, facilities and knowledge to advance their work, solve problems and take their research to the next level.

Services on offer include development of bespoke and tailored solutions for your specific needs, such as predictive models, graphical user-friendly interfaces, KNIME nodes, data mining workflows or data shepherding to support implementation of data management processes.

This is your last chance to submit your TA application. The Final TA application submission date is 31 March 2022 (projects to be completed by 30th June 2022)!

[Click here to submit your application now!](#)

Further information regarding the TA access services, TA access guidelines, awarded projects, frequently asked questions, etc. can be found by clicking on this [link](#).

You can also learn more about the NanoCommons TA by contacting us through the [NanoCommons Helpdesk](#) or by mailing helpdesk@nanocommons.eu.

Transnational Access

Looking forward to working with you!

CHARISMA shares its latest developments

Besa Maliqi Sylva
Yordas GmbH, Germany
info@h2o2ocharisma.eu



The CHARISMA Project has shared its latest newsletter, in which it highlights the project's recent developments, meetings, and publications among other news updates.

Reports include a description of the 2nd biannual Consortium Meeting, which was held in Copenhagen (see image below) and online. The two-day event began with the welcoming of external advisory board members, and presentations generated prolific discussions surrounding the CHARISMA Wikidata for terminology harmonization, especially in respect of the database architecture to support Round Robin and use cases.

The Consortium members also had the opportunity to experience the prototypical Raman CHADA software. A practical introductory session was held to showcase the Raman CHADA from its installation phase to the first data set analyses.

The next phase of the project will see a strong focus on the demonstration activities of the three industrial cases and contribution to future standardization activities

The Newsletter also highlights their latest publication: CEN WORKSHOP AGREEMENT on Materials characterisation - Terminology, metadata and classification, which can be [accessed here](#).

For more information, visit the [CHARISMA Project website](#)



GRACIOUS has Successfully Achieved its Goals!

H2020 GRACIOUS project helps to bring grouping and read-across of nanomaterials into practice



Forward by Vicki Stone, H2020 GRACIOUS Project

"We are very happy to share with you the achievements of the H2020 project GRACIOUS.

The problem addressed by GRACIOUS - For all substances, including nanomaterials, their safe use requires assessment of risk. Each nanomaterial of a particular substance (e.g. TiO_2) may be available in multiple nanoforms that vary in characteristics such as shape, size and coating. Assessing the risks of each nanoform on a case by case basis is expensive, time consuming and requires lots of test animals.

Grouping is an alternative approach that can be used to reduce the testing needed for risk assessment of nanomaterials for regulatory purposes. In addition, grouping can also be used for non-regulatory reasons. For instance, grouping may assist the introduction of Safe(r)-by-Design methods into product development of nanoforms and nano-enabled products. It may also help in the identification of suitable risk management measures for industrial or professional facilities using nanomaterials.

According to the European REACH regulations for chemicals, grouping requires generation of a scientific hypothesis to explain why substances are sufficiently similar to be grouped. This explanation should be scientifically solid and can be used to fill data gaps with already existing information. Evidence, including a data matrix, is required to allow the grouping hypothesis to be accepted. Once a group is established, read-across of data can then be conducted. This means that data from source substances which include hazard data for risk assessment, may be used in order to fill the hazard data gaps of target substances.

Grouping and read-across of nanomaterials requires other considerations than regular substances, as not only chemical, but also physical properties of a material can have an impact on risk. However, the actual application of grouping and read-across for nanomaterials is limited, because detailed approaches to substantiate grouping and read-across of nanoforms are missing.

Project achievements - The GRACIOUS project generated a Framework to support grouping and read-across of nanoforms. The Framework will allow end users to identify if one of the pre-defined GRACIOUS grouping hypotheses are relevant to their nanoform. It is key that grouping decisions are hypothesis based. We have generated robust grouping hypotheses, based on existing published literature and grey literature. Each grouping hypothesis has an integrated approach to testing and assessment (IATA). This guides what information an end user needs to obtain to make a grouping decision. The IATAs are structured as decision trees and in the first instance we encourage end users to perform a literature search. This allows the end user to identify if existing information can be used to make a grouping decision for each decision node. If data gaps need to be filled, then the end user can use the tiered testing strategies which accompany each decision node of the IATA.

These strategies are designed to identify what experimental testing should be performed to generate the necessary data for a grouping decision. The IATAs allow an end user to identify if the grouping hypothesis can be accepted or rejected. It may be that none of the GRACIOUS pre-defined grouping hypotheses are appropriate. For those cases we developed a hypothesis template to help end-users to formulate their own grouping hypothesis. Furthermore, different approach to quantify the similarity between nanoforms are compared and applied to case studies to gain experience.

This Framework has been extensively tested by industrial, regulatory and academic stakeholders. The approaches used are sufficiently flexible to allow use of predicted or estimated data in the early concept stages. Such data often have high levels of uncertainty. As the user progresses through development of the nanomaterial/product, the predicted or estimated data are replaced with data sources of higher certainty. These higher certainty data are more suitable for regulatory purposes."

The GRACIOUS project partners are now happy to share some of their flagship results:

[Cntd →](#)



[Cntd →](#) **GRACIOUS Has Successfully Achieved Its Goals!**

The GRACIOUS Guidance Documents are described in the next article and available here: [GRACIOUS Guidance Document](#) & [Guidance in a Nutshell](#).

The GRACIOUS Blueprint

The GRACIOUS Framework is also available as a software Blueprint PDF document. This provides building blocks and insights on how to implement the GRACIOUS framework – or specific parts of it – into existing and future software for risk assessment or safe(r)-by-design. The Blueprint will be made publicly available in [Zenodo](#). The Blueprint is open for any interested parties who wish to integrate elements of the GRACIOUS Framework in their software tools. The Blueprint will be further developed in H2020 projects SAbYNA, SbD₄Nano, SUNSHINE and HARMLESS. Updates are to be expected in the upcoming years.

The GRACIOUS Blueprint has been tested and already programmed in the SUN Decision Support System (SUNDS) which is freely available at www.sunds.gd by self-sign-up. Blueprint entities and rules for Integrated Approaches to Testing and Assessment (IATA) application have been integrated into the original SUNDS framework. This framework is now capable of performing risk assessment considering nanoforms' characterization parameters and IATA based groups. The enriched data structure allowed by the blueprint makes the sustainability assessment provided by SUNDS more reliable and precise.

The GRACIOUS Further Achievements

Within three and a half years of intensive work, the GRACIOUS consortium aimed at reaching the ambitious goal to develop a highly innovative science-based grouping and read-across Framework. This has resulted in the development of a number of scientific, educational and innovation results. We believe these results will have a long-term impact in the nanotechnology field.

These include:

- The GRACIOUS Similarity Assessment Methodology
- The GRACIOUS Data Quality Assessment Methodology
- The GRACIOUS IATAs and Hypotheses Templates (e.g. [HARN IATA](#), [Inhalation IATA](#), [Ingestion IATA](#), [Framework structure description](#))
- The GRACIOUS Decision trees, Templates, and Library for generation of grouping approaches
- The GRACIOUS Nanomaterial Physicochemical templates
- The GRACIOUS standard operating procedures (SOPs) (e.g. of known reproducibility, coating degradation assays, reactivity, dissolution)
- The GRACIOUS WIKI (terminology harmonizer)
- [The GRACIOUS Database](#) - an instance of the eNanoMapper Database that compiles data generated in the GRACIOUS project.
- [GRACIOUS Videos](#) - GRACIOUS developed a number of short videos explaining key aspects of the GRACIOUS Framework.
- GRACIOUS educational materials - GRACIOUS has developed a number of [webinars](#), workshops and [training sessions](#) on various topics relevant for the project.
- [GRACIOUS peer-reviewed literature](#) - GRACIOUS is at the forefront of open science. We have published a number of open access manuscripts describing our scientific results. These are available to access via our [website](#) and [Openaire](#). Please keep an eye at our website for new publications!
- GRACIOUS research data and other publications - GRACIOUS other research products are published and freely available at [Openaire](#). These include templates, SOPs, presentations, etc.

Project Facts:

Project Duration:	42 months, starting January 2018
Consortium:	The GRACIOUS consortium consists of 23 partners spanning Europe and the USA, including representatives from academia, industry, policy makers and regulators.
Total Budget:	7.1 Million EUR total project volume

Press Contact:

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Insights from GRACIOUS IMPACTS FORUM

A Stakeholder Engagement and Training Workshop & GRACIOUS - NMBP-16 Projects Ambassadors' Event



H2020 GRACIOUS came to its end in September 2021 after 3 and a half years of intensive work aimed at reaching the ambitious goal to develop a highly innovative science-based framework designed to enable practical application of grouping, leading to read-across and classification of nanomaterials/nanoforms.

The GRACIOUS Impacts Forum, held on 13 - 15 September on a virtual platform, gathered more than 120 participants from regulation, academia, industry, and the general public.

About the Stakeholder Engagement and Training Workshop Session

The first two days of the event were devoted to provide training to stakeholders on key results from GRACIOUS and to discuss key insights from the GRACIOUS case studies. Presentations have been given on the following topics:

- The GRACIOUS Framework for grouping and read-across nanomaterials/nanoforms
- The GRACIOUS Guidance Document, detailing the components of the Framework and how to use it
- The GRACIOUS technical open access Blueprint which enables anyone to programme the GRACIOUS Framework into their own risk assessment tools
- The GRACIOUS WIKI - a terminology harmoniser aimed at streamlining definitions for the different elements of the GRACIOUS Framework
- The GRACIOUS Nanosafety data quality assessment methodology
- The GRACIOUS similarity assessment methodology
- Insights from the GRACIOUS case studies

While presenting the GRACIOUS Framework Vicki Stone, Coordinator of the project clarified:

'The Framework is populated with forty pre-defined hypotheses. They have been generated by partners of the GRACIOUS project based on literature and generation of the new data. If these pre-defined hypotheses are not suitable for your application then you can make your own user-defined hypotheses using a template and we provided to help you'.



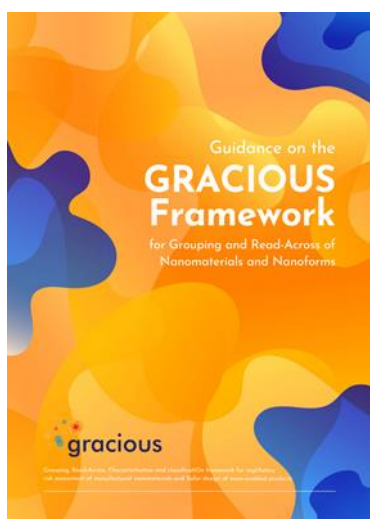
Key Results

The GRACIOUS project has developed two Guidance documents explaining how users from industry, regulation and academia can use the GRACIOUS Framework for grouping and read-across of nanomaterials/nanoforms.

The first is a detailed GRACIOUS Guidance Document which provides users with a detailed step-by-step guidance on how to use the Framework. This document also includes hands-on examples and practical tips for users. The second is a Guidance in a Nutshell. This is a simplified short version of the detailed document. It is intended to be an introduction to both the concepts used in the GRACIOUS Framework and the main steps the user will need to address during the use of the Framework.

Both documents were presented during the event and are made publicly available in the GRACIOUS website [HERE](#).

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About the GRACIOUS - NMBP-16 Projects Ambassadors Event

The final day of the GRACIOUS Impacts Forum, 15 October was devoted to its Final Consortium Meeting and a closed workshop with the NMBP-16 projects (SUNSHINE, HARMLESS and DIAGONAL). During the Consortium Meeting the project partners presented an overview of the actual developments and overall project results. This was followed by an interactive workshop with partners from GRACIOUS and the NMBP-16 Projects devoted to develop action plans for joint collaborations on a number of topics e.g. grouping of MCNMs, risk management, data management and stakeholder engagement among others. This platform was an excellent avenue for transferring the key results from the GRACIOUS projects to newly started initiatives to allow continuation and to ensure that the impact and the legacy of the project will continue beyond its lifetime.

Recordings from the GRACIOUS Impacts Forum Public events are available to watch on demand

- DAY 1: GRACIOUS Hands-on Training on Tools and Approaches: <https://www.youtube.com/watch?v=6X4ggf6OAwU>
- DAY2: GRACIOUS Case Studies: <https://www.youtube.com/watch?v=7Ua7TvFnAdI>

More project updates can be found on www.h2o2ogracious.eu and you can follow us on Twitter @h2o2ogracious.

Press Contact:

Dr Stella Stoycheva, Yordas Group, s.stoycheva@yordasgroup.com

GOV4NANO presents at OECD Webinar

The NMBP-13 project, Gov4Nano, recently presented its work during the OECD Webinar held on December 2nd: **"How to access exposure to nanomaterials? The evaluation result of existing tools/models"**.



With the dramatic increase of nano-enabled products entering the market every year, human and environmental exposures are inevitable, which raises concerns in terms of the health and safety of such emerging nanomaterials. Scientific knowledge to assess the exposure to nanomaterials continues to improve. As an example, new exposure tools and models for nanomaterials are being developed. To further promote the development in this area, the OECD compiled an inventory of available models and tools for assessing occupational, consumer and environmental exposure to Nanomaterials. 54 tools and models were initially compiled and following in-depth analyses, 10 occupational, 7 consumer and 6 environmental tools/models were recommended or evaluated as suitable for assessing exposure to nanomaterials.

The detailed information on the analyses and evaluations are provided in the reports accessible from [the Series on Testing and Assessment website](#) (No. 345, 346, 347 and 348). In this webinar, the researchers presented the key findings

Chair:

- Vladimir Murashov (National Institute of Occupational Safety & Health, USA)

Speakers:

- Occupational project: Carla Ribalta Carrasco (National Research Center for Working Environment, Denmark)
- Consumer project: Mohammad Zein Aghaji (Health Canada)
- Environmental project: Marc LaPointe, Mathieu Dextraze (Environment and Climate Change Canada)

Access the presentations

Occupational project: Carla Ribalta Carrasco, PhD | [Occupational project](#)

Consumer project: Mohammad Zein Aghaji, PhD | [Presentation](#)

Environmental project: Marc LaPointe, Mathieu Dextraze | [Presentation](#)

Videos of other webinars in the series are here: [Webinar Series on Testing and Assessment Methodologies - OECD](#)

Successful Conclusion to 2nd NanoHarmony Workshop

NanoHarmony



[NanoHarmony](#) is a Coordination & Support Action (CSA) project funded under the European Commission Horizon 2020 programme with the mission to support the development of Test Guidelines and Guidance Documents where nanomaterial adapted test methods have been identified as a regulatory priority. Alongside the coordination of available data and information to support the finalisation of test method development, [NanoHarmony works to develop a sustainable network of stakeholders interested in the development and use of test guidelines and to help improve the OECD test guideline development process.](#)

Over 3 days in November, [NanoHarmony successfully concluded its 2nd Workshop](#), bringing together over [300 experts and stakeholders](#) interested in the development and use of test guidelines. During the Workshop, stakeholders had the opportunity to join specific sessions dedicated to share their expertise. Best practices and obstacles in the development of OECD Documents were discussed in dedicated sessions separately with regulators and industry to help shape recommendations to future changes to the test guidelines process. The workshop also included nine expert group meetings for the test guidelines developments included in [NanoHarmony](#) and [Gov4Nano](#), where invited experts were able to give their inputs into each of the test methods and endpoints covered by the project. Finally, there was an open day during the Workshop, attended by over 100 people, which provided an update on the project and all of the test guidelines being developed within the [NanoHarmony](#), [Gov4Nano](#) and [RISKGone](#) projects.

["It is vital that we listen to the key stakeholders"](#) says Professor Thomas Kuhlbusch, Head of Unit Hazardous Substances Management at the German Federal Institute of Occupational Safety and Health (BAuA) and coordinator of the NanoHarmony project. ["Developing new test guidelines and guidance documents is only part of the aim of NanoHarmony. We want to listen to the opinions of all of our stakeholders' worldwide: e.g. from scientists who help design new test methods, regulators who require new methods to implement chemical regulations, to industry, who need test methods to fulfil their regulatory obligations. All of our stakeholders have valuable expertise that we wish to learn from and without their input, our project would not succeed"](#).

While continuing to develop the specific test guidelines covered in the project, NanoHarmony will look in more details into possible improvements to bridge science, regulation and harmonisation in the next phase. During 2022 there will be further events aimed at all stakeholders to help the project define the best practice for guideline development and to help propose refinements to make the process more efficient. Please keep informed by signing up to the [NanoHarmony Newsletter](#).

The recording of the open day sessions of the workshop is available on YouTube. [Watch it here](#).

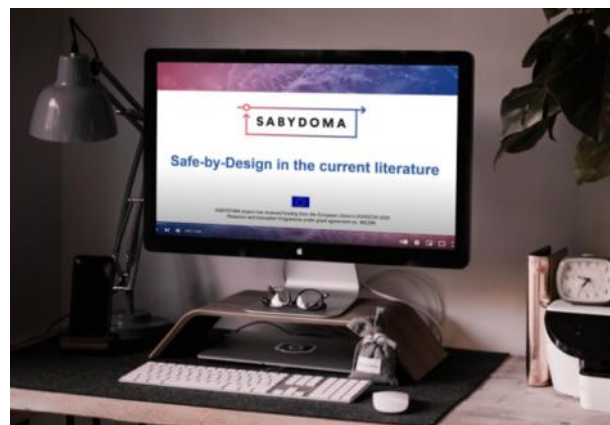
As well, you can find the agenda with the presentations from the different sessions on [NanoHarmony's website](#).

NanoHarmony has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 885931

Video presentation of SABYDOMA's findings

[SABYDOMA](#) has prepared a video presentation with some of its findings.

On this occasion, Benjamin Trump, assisting [Factor Social](#), explains in this presentation the results of the work carried out by SABYDOMA on the literature review on [Safe-by-Design \(SbD\) in the current literature related to engineered nanomaterials \(ENM\)](#). After going over the methodology following an extensive literature research, he discusses different themes, analyses and ideas that are discussed throughout different sections of the ENM and SbD literature. Furthermore, he explores a few selected policy documents that bring up core concepts of SbD within the ENM space, both as a philosophy and as a method, that can help further SbD development in the marketplace moving forward.



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

NanoSolveIT Stakeholder Workshop

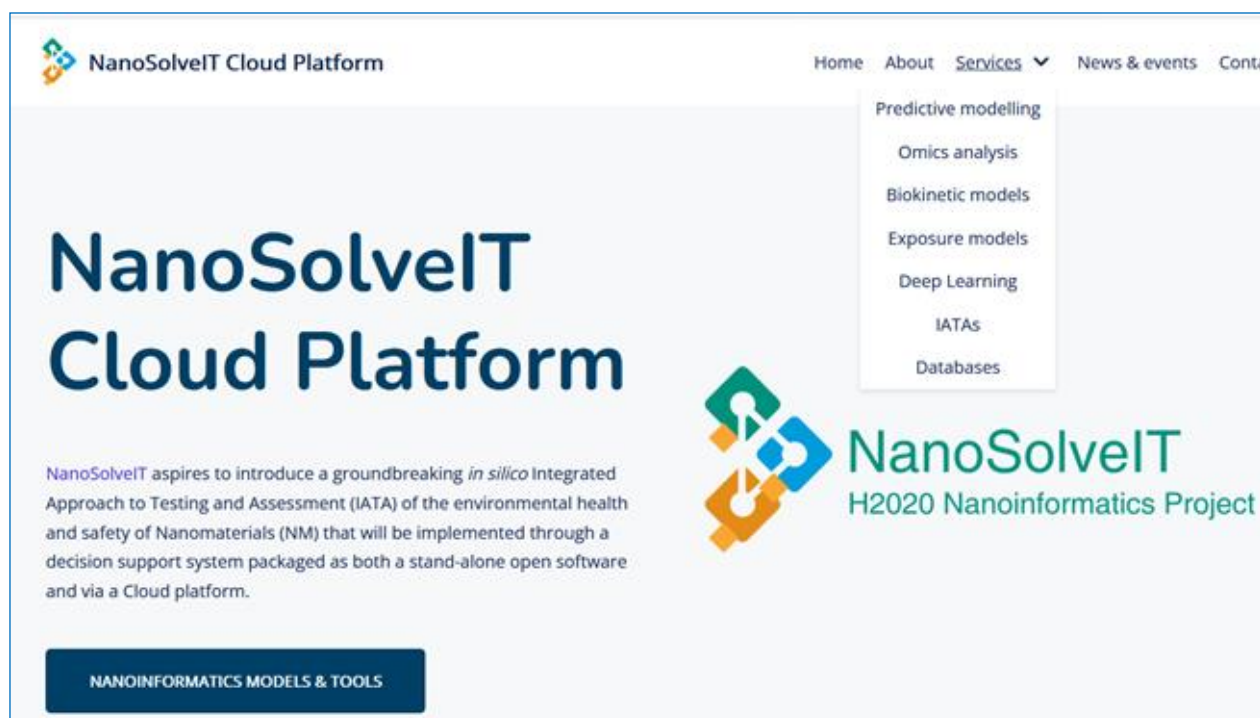
IATA demonstration workshop for SMEs, regulators & relevant stakeholders



A demonstration workshop was organized by H2020-funded project [NanoSolveIT](#) on the 7th of December 2021 with the participation of more than 60 people from academia, industry, regulatory authorities, and EU Institutions.

The full list of the currently available NanoSolveIT models & tools (exposure models, predictive modelling, omics analysis, biokinetic models, deep learning, IATAs and databases) is available at the [NanoSolveIT Cloud Platform](#), each with a user-friendly interface and complete documentation of its domain of applicability and validation. Additional models are constantly being developed and added.

Please feel free to register [here](#) to receive the training materials and more info about the workshop, if you are interested to test one of more of the models and give us feedback.



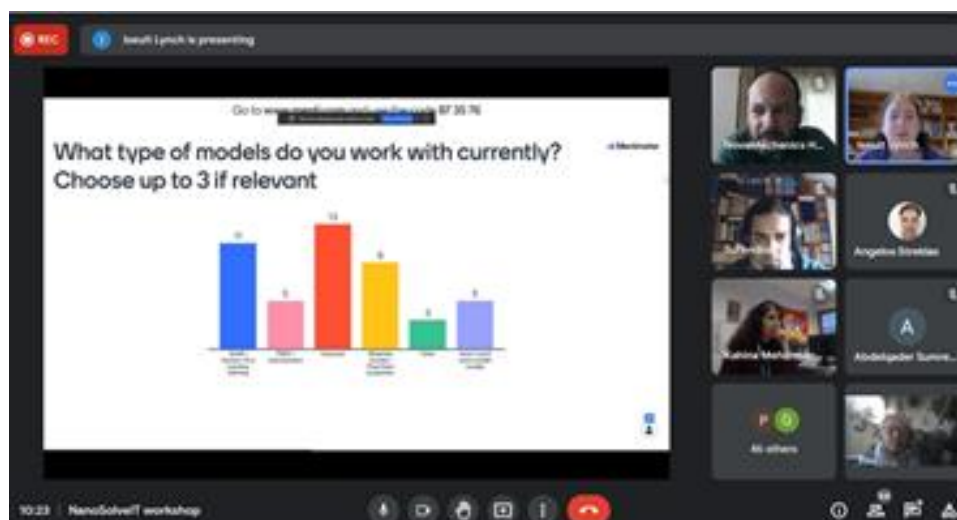
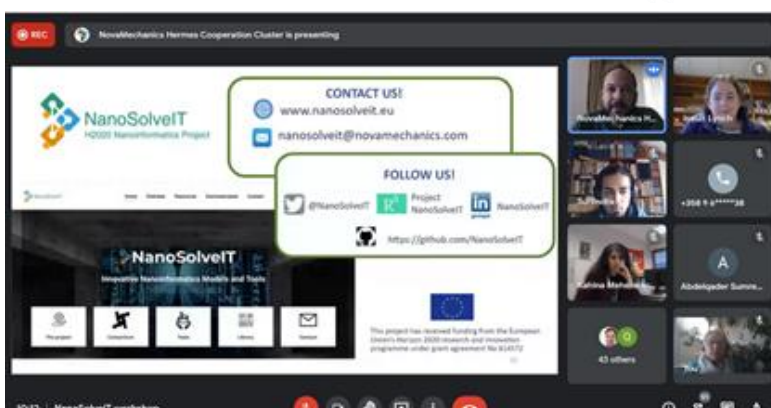
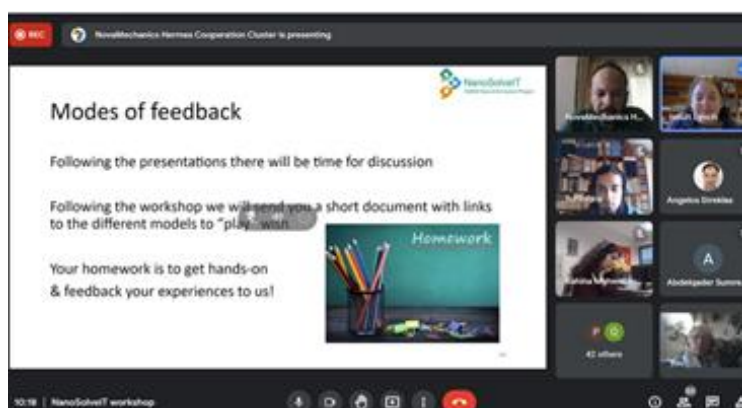
The screenshot shows the NanoSolveIT Cloud Platform homepage. The header includes the NanoSolveIT logo, the text 'NanoSolveIT Cloud Platform', and navigation links: Home, About, Services (with a dropdown menu), News & events, and Contact. The dropdown menu lists: Predictive modelling, Omics analysis, Biokinetic models, Exposure models, Deep Learning, IATAs, and Databases. The main content area features the title 'NanoSolveIT Cloud Platform' and a paragraph stating: 'NanoSolveIT aspires to introduce a groundbreaking *in silico* Integrated Approach to Testing and Assessment (IATA) of the environmental health and safety of Nanomaterials (NM) that will be implemented through a decision support system packaged as both a stand-alone open software and via a Cloud platform.' Below this is a dark blue button with the text 'NANOINFORMATICS MODELS & TOOLS'.

Models & Tools @NanoSolveIT Cloud Platform



No	Category	Description	URL
1	Exposure Models	Multi-box aerosol occupational exposure model	https://aerosol.cloud.nanosolveit.eu/
2	Exposure Models / Integrated Approaches to Testing and Assessment (IATAs)	NanoFase WSO Environmental exposure model	https://nanofase.cloud.nanosolveit.eu/
3	Deep Learning & Image Analysis Tools	Deep Learning model to predict NM exposure effects on Daphnia Magna	https://deepdaph.cloud.nanosolveit.eu/
4	Predictive Models (QSAR/Read-across)	Cytotoxicity (Cell Viability) Prediction for Metal Oxide NPs	https://cellviability.cloud.nanosolveit.eu/
5	Predictive Models (QSAR/Read-across)	Read-Across Model for Zeta Potential Prediction	https://zetapotential.cloud.nanosolveit.eu/
6	Predictive Models (QSAR/Read-across)	MS ² D Zeta Potential Predictive Model	https://ms2d.cloud.nanosolveit.eu/
7	Predictive Models (QSAR/Read-across)	Vyrtos (Gold NM cell association, CNT absorption coefficients)	https://vyrtos.cloud.nanosolveit.eu/
8	Predictive Models (QSAR/Read-across)	NanoPot (logD, Zeta Potential in water, Cellular Uptake of AS49 of Gold ENM)	https://nanopot.cloud.nanosolveit.eu/
9	Predictive Models (QSAR/Read-across)	SAPNet: predict the toxicity of nanoparticle towards the CHO-K1 cell line	https://sognets.cloud.nanosolveit.eu/
10	Predictive Models (QSAR/Read-across)	Cytotoxicity (Cell Viability) Classification Model	https://cytotoxicity.cloud.nanosolveit.eu/
11	Biokinetics models	Human Inhalation Model	https://lungexposure.cloud.nanosolveit.eu/
12	Biokinetics models	Nanobio: a Biokinetic model for ENM distribution in freshwater ecosystems	https://nanobio.cloud.nanosolveit.eu/
13	Biokinetics models	Nanolnhale: a PBPK model for describing the biodistribution of TiO ₂ in humans after inhalation exposure	https://nanolnhale.cloud.nanosolveit.eu/
14	Biokinetics models	Biodaph: a simple kinetic model for describing the biodistribution of different TiO ₂ ENMs in D. magna	https://biodaph.cloud.nanosolveit.eu/
15	Omics Analysis/Molecular Pathways/AOPs	eUTOPIA - Preprocessing and analysis of omics data	https://eutopia.cloud.nanosolveit.eu/eUTOPIA/
16	Omics Analysis/Molecular Pathways/AOPs	FunMappOne - Visualisation of molecular biology experiments	https://funmappone.cloud.nanosolveit.eu/
17	Omics Analysis/Molecular Pathways/AOPs	Molecular Pathway database access with SPARQL queries	https://virtuoso.cloud.nanosolveit.eu/
18	Omics Analysis/Molecular Pathways/AOPs	Adverse Outcome Pathway Wiki data access with SPARQL queries	https://virtuoso.cloud.nanosolveit.eu/
19	Databases & Data Enrichment	NanoPharos database	https://db.nanopharos.eu/
20	Databases & Data Enrichment	NanoSolveIT Knowledge Base	https://ssl.biomax.de/nanosolveit/cgi/login_biomx_portal.cgi
21	Databases & Data Enrichment	ChEMBL: protein binding info and assay data	https://chemblmirror.rdf.biocat-bioinformatics.org/
22	Databases & Data Enrichment	BridgeDb	https://bridgedb.github.io/swagger/
23	Integrated Approaches to Testing and Assessment (IATAs)	NanoSolveIT IATA: PBPK models and integration with the occupational exposure model	https://exposrepbpbk.cloud.nanosolveit.eu/
24	Deep Learning & Image Analysis Tools	Nanolmage: An automated tool for extracting descriptors from electronic images	https://nanolmage.cloud.nanosolveit.eu/nanolmage/
25	Predictive Models (QSAR/Read-across)	Model for zeta potential prediction	https://zetapot.cloud.nanosolveit.eu/
26	Predictive Models (QSAR/Read-across)	Facet Cytotoxicity Prediction	https://facetcytotoxicity.cloud.nanosolveit.eu/
27	Exposure Models	Simple Box4Nano (beta version)	http://enolasccloud.navomechanics.com/beta/simplebox4nano/

Cntd → **NanoSolveIT Stakeholder Workshop**
IATA demonstration workshop for SMEs, regulators & relevant stakeholders



The Agenda

Time (CET)	Topic	Presenter(s), Moderators(s)
10:00-10:05	NanoSolveIT Nanoinformatics Project	Antreas Afantitis
10:10-10:15	Goals of the NanoSolveIT workshop	Iseult Lynch & Maria Dusinska
10:15-10:25	Who is at the table ? Meet our "beta testers"...	Iseult Lynch
10:25-10:35	In silico modelling of toxicological hazard for use in regulatory risk assessment	Qasim Chaudhry
10:35-10:50	Discussion & other stakeholder perspectives / needs	All
10:50-11:05	Ecotox Hazard Models: Acute Daphnia toxicity	Georgia Melagraki
11:05-11:20	Exposure models - human and environmental exposure	Nikolaos Cheimarios
11:20-11:30	Coffee Break	
11:30-11:45	NanoMixHamster: a web-based tool for predicting cytotoxicity of TiO ₂ -based multi-component nanomaterials towards Chinese Hamster Ovary (CHO-K1) cells	Filip Stolinski
11:45-12:00	Physchem property prediction models (Zeta potential, computational descriptors)	Anastasios Papadiamantis
12:00-12:15	Linking Exposure, PBPK and Risk Assessment - Towards IATA	Periklis Tsiros
12:15-12:30	Data management tools: NanoSolveIT KnowledgeBase	Dieter Maier
12:30 -12:55	Stakeholder feedback on the approach: individual models integration approach / IATA User interfaces Validation documentation completeness anything else of interest..	Maria & Iseult to Chair the discussion
12:55-13:00	Discussion - Sum up & next steps	Antreas Afantitis & Iseult Lynch

CUSP and University of British Columbia Workshop Challenges of Analytics—Video Available



The CUSP-UBC Workshop: “**Analytics: Characterization and quantification / enumeration of particles in the environment and in tissue**” was held online on 28th January 2022. Despite the unsocial hours, 69 participants took part from all five CUSP Projects and the University of British Columbia Cluster for Microplastics, Health and the Environment, to **share experiences, exchange knowledge, and to discuss challenges and solutions** as part of a great collaboration between the two clusters.

Following a welcome from Lesley Tobin (top, left) (CUSP WG6 Lead Communications and Dissemination WP6 Lead PlasticsFatE) the workshop opened with **Mahdi Takaffoli**, (top, right) Coordinator, Cluster for Microplastics, Health and the Environment, introducing the **UBC MNP Cluster** – a multi-disciplinary, multi-campus network of research initiatives.

In a succinct explanation of the **grand challenge**, Mahdi described how MPs have now been detected on deep-sea sediments, Arctic Sea ice, wastewater, drinking water, food, soil, and air. This can **adversely impact ecological and human health, global food security and the economy**. The UBC MNP Cluster’s overarching goal is to **offer scientific insight and evidence** to support **corrective actions** and **policy development** to **reduce the impact of MPs in the environment towards building a cleaner future**, giving examples of ongoing projects (right).

The CUSP Cluster was then presented by Lesley Tobin, who took participants on a quick tour of the cluster through its five **flagship projects** and **six working groups**.

Ongoing Project Examples

<p>Understanding the Seasonal Impacts Of Microplastic Inhalation on Health</p> <ul style="list-style-type: none"> • Detecting and characterizing inhalable and respirable microplastics in indoor and outdoor air seasonally • Exploring their potential adverse effects on health. 	<p>Sources, Sinks And Fate Of Microplastics In The Strait Of Georgia And Its Urbanized Watershed: A Solution-oriented Natural Mesocosm Study</p> <ul style="list-style-type: none"> • Studies on the sources, transport and fate of MPs in the Strait of Georgia (SoG) and its urbanized watershed • Experiments on microbial-mediated MPs degradation • Developing predictive models to evaluate the ultimate fate of MPs in SoG.
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Microplastics Cluster 6

Each CUSP research project is investigating different aspects related to MNPs and health:

- 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
- the development of a comprehensive measurement and testing program

The five CUSP projects collaborate across six working groups:

- WG1 - **Analytical methods and representative materials**
- WG2 - **Data sharing**
- WG3 - **Inter-laboratory comparisons**
- WG4 - **Exposure assessment**
- WG5 - **Risk assessment**
- WG6 - **Communication and Dissemination**

Each working group has representatives from all five projects, and they be collaborating and sharing knowledge and experiences with other organisations, networks and clusters too, including UBC, Momentum (NL); Austrian MNP Network; NanoSafety Cluster; PlasticsEurope; and Ocean Diagnostics, among others.

Ultimately, the CUSP research results will contribute to the health-relevant aims of the EU Strategy for Plastics in a Circular Economy, as well as the REACH restrictions on intentionally added MNPs to products by providing new evidence for better preventive policies.

This led into the main presentations, whereby researchers from both clusters delivered engaging talks to highlight challenges and solutions, as follows:

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- **Florian Meirer** (Associate Professor, Inorganic Chemistry and Catalysis research group at Utrecht University; Polyrisk & Aurora) "Characterizing Nanoplastics with Force Microscopy – An Update" F.Meirer@uu.nl
- **Anna Costa** (Environmental Nanotechnology and Nano-Safety group of CNR-ISTEC; PlasticsFatE) "Strategies for MP/ NP simulated samples-laboratory tests" anna.costa@istec.cnr.it
- **Tao Huan** (Assistant Professor, Chemistry, The University of British Columbia) "Pilot Study of the Impact of Microplastics on Cell Liability and Potential Application of Metabolomics in Understanding the Biological Mechanisms" thuan@chem.ubc.ca
- **Edward Grant** (Professor, UBC Chemistry) "The challenge of representative microplastic analysis" edgrant@chem.ubc.ca

For more information

The video of the event and complementary slides can be accessed here: <https://zenodo.org/record/5914353>

Find out about the UBC cluster ([Microplastics | \(ubc.ca\)](https://microplastics.ubc.ca)); the researchers who form the network [[Faculty Members | Microplastics \(ubc.ca\)](#) and [Students and Postdocs | Microplastics \(ubc.ca\)](#)]; and the different MNP related projects [[Research | Microplastics \(ubc.ca\)](#)]

Contact Mahdi.takaffoli@ubc.ca, Coordinator, Cluster for Microplastics, Health and the Environment

Find out about CUSP, its five member projects and its six working groups: www.cusp-research.eu

Contact Lesley.tobin@optimat.co.uk

[CUSP WG6 Lead Communications and Dissemination WP6 Lead PlasticsFatE.](#)

About CUSP

Funded by the European Union, we are a multidisciplinary team of scientists, industry and policymakers collaborating in research on the complex relationship between micro- and nanoplastics (MNPs) and human health, from early life to adulthood.

Micro and nanoplastics inside our body

Micro- and nanoplastics (MNPs) are out in the environment and part of our everyday life. They find their way into our body through the food we eat, the water we drink and the air we breathe, yet we currently do not know how they might be affecting human health. These 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. Pollutants, such as heavy metals, allergens, toxicants, and microorganisms, can latch on to them and may further



From Science to Policy

The European Union is spearheading efforts in research on MNPs

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.

Towards Safe and Sustainable Advanced (Nano)materials with EWARN

The RIVM (NL), BfR, BAuA and UBA (GER) have developed a new system to systematically identify potential issues of concern for advanced (nano)materials. This proactive system could contribute towards the development of safe and sustainable advanced nanomaterials. Your input is needed to further develop this system.

A need for proactive risk governance of advanced (nano)materials

New and complex nanomaterials are continuously being developed. These innovative or advanced nanomaterials may play an important role in large societal challenges such as transition to green energy. However, they may also pose potential risks for human health and the environment, or they can create unforeseen sustainability issues.

It is therefore important to develop an anticipatory risk governance approach and to proactively avoid the occurrence of potential unexpected risks of advanced (nano)materials. Addressing safety and sustainability issues early in the innovation chain can support innovation by preventing problems later on.

Early WArning, pRioritisation and actionN system' (EWARN)

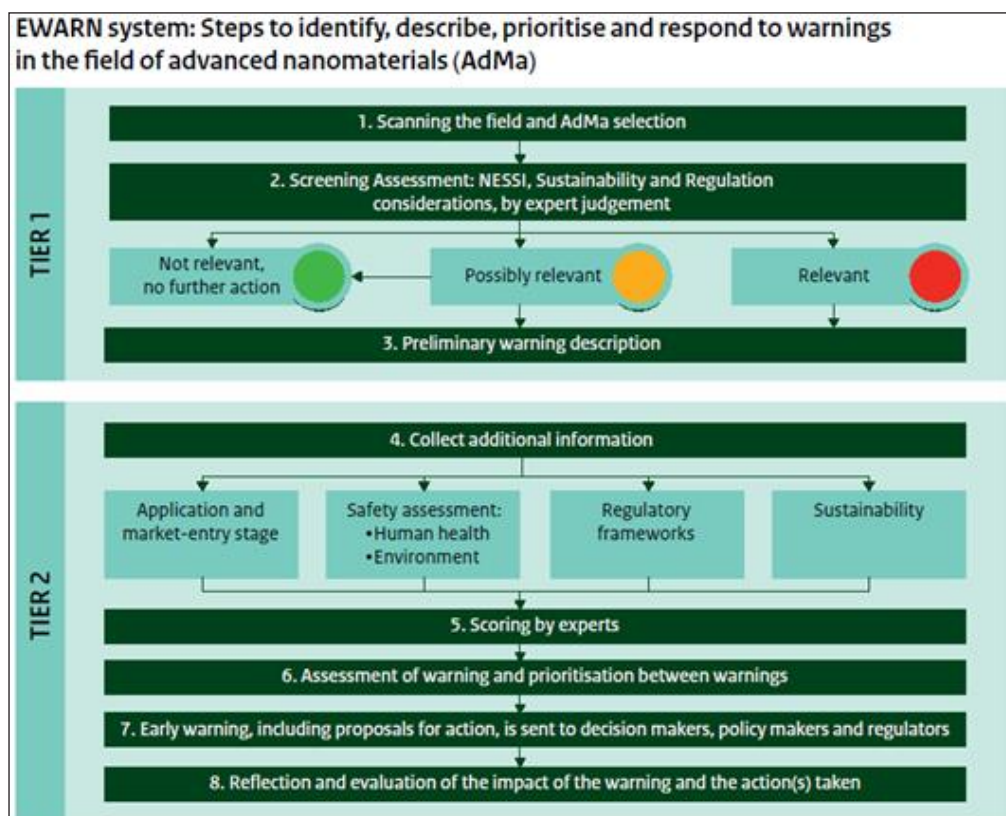
Towards this goal, the RIVM (NL), BfR, BAuA and UBA (GER) have proposed a system (EWARN) to systematically identify emerging issues of advanced nanomaterials. The system combines an early warning approach developed by BfR, BAuA and UBA (i.e. 'NESSI') with a more detailed warning system developed by the RIVM (see figure below). The EWARN system may be applied by regulators, risk assessors, as well as innovators.

Details of how this system works are described in a recently published [brochure](#)¹.

Your feedback is needed

The brochure of the EWARN system should be regarded as a thought starter. Your feedback is needed on the structure and content of the proposed EWARN system and on the scoring system. With your feedback, the EWARN system can be shaped and improved. The ultimate goal is to present an improved EWARN system to facilitate discussions at an EU-level and to bring the system to the OECD WPMN Steering Group on advanced (nano)materials.

Please provide your feedback via: KIR-nano@rivm.nl. The first consultation round is now open. You can give input until April 2022.



¹ <https://www.rivm.nl/en/nanotechnology/risks-of-nanotechnology-knowledge-and-information-centre-kir-nano>

Next SAF€RA joint call to be launched soon!



Coordination of European Research on Industrial Safety towards Smart and Sustainable Growth

In the recent SAF€RA newsletter, Paolo Bragato (INAIL), Chairperson of SAF€RA, announced the following:

"SAF€RA is a formal Partnership, created in 2015, at the end of the European ERANET project (Grant Agreement no 291812/2012), which aimed to strengthen research on industrial safety.

Today, SAF€RA gathers 16 organizations from 12 European countries and manages funds for research on industrial safety and allied topics, including safety of nanomaterials.

Since 2013, six SAF€RA joint calls for projects have been launched, fully funded by the SAF€RA Partners. To select the topics, SAF€RA organizes symposia, inviting renowned experts from industry and academia. An independent panel evaluates the proposals, and the funding arrangements used involve little bureaucracy. 27 projects have been funded to date, with two more projects at the starting line. The projects have involved 70 operating units from 17 European countries, covering many of the topics of "industrial safety", and involving the best European Universities and Research Institutes.

The Partnership is preparing the 7th call for proposals that will be launched during the SAF€RA Symposium in Rome. It shows the interest in safety in the changing economy and in the context of environmental and energy constraints "

In March 2022 it is planned to launch the 7th Joint call. SAF€RA partners are willing to fund RTD-projects in the following topic areas:

- Green safety: Plant safety in the context of the sustainability imperative
- Nano safety: Protective clothing and PPE for industrial safety, including nanostructured materials
- Safety in new business models such as the platform economy

The next SAF€RA Symposium in Rome, May 19th & 20th, 2022

A detailed description of the topics is in progress and will be shared before the next SAF€RA Symposium, to be held in Rome on May 19th-20th (postponed from March 2022). SAF€RA is organizing a hybrid event for which the agenda will include an overview about the results of the previous funded projects, keynote lectures in relation with the new 7th joint call for projects, and a matchmaking workshop for project addressing topics of the new call.

Participation in the event is free of charge (except social activities) and registration will be open from early January to February 11, 2022.



Nanotechnology for a Sustainable Future: Addressing Global Challenges with the International Network⁴Sustainable Nanotechnology

Lisa Pokrajac, Ali Abbas, Wojciech Chrzanowski, Goretti M. Dias, Benjamin J. Eggleton, Steven Maguire, Elicia Maine, Timothy Malloy, Jatin Nathwani, Linda Nazar, Adrienne Sips, Jun'ichi Sone, Albert van den Berg, Paul S. Weiss, and Sushanta Mitra*

<https://doi.org/10.1021/acsnano.1c10919>

ACS Nano 2021, 15, 18608–18623

Abstract:

Nanotechnology has important roles to play in international efforts in sustainability. We discuss how current and future capabilities in nanotechnology align with and support the United Nations' Sustainable Development Goals. We argue that, as a field, we can accelerate the progress toward these goals both directly through technological solutions and through our special interdisciplinary skills in communication and tackling difficult challenges. We discuss the roles of targeting solutions, technology translation, the circular economy, and a number of examples from national efforts around the world in reaching these goals. We have formed a network of leading nanocenters to address these challenges globally and seek to recruit others to join us.

'Inventory of research into Safe-by-Design Horizon2020 projects from 2013 to 2020' Nanotechnology and Safe-by-Design (rivm.nl)

This report is an extensive inventory of all activities that have been developed around Safe-by-Design. It provides substantial information as a basis on which to formulate and implement further activities on SbD both at the national level and in the EU.

Summary

A safe, clean and healthy living environment is very important for Europe. The Dutch government aims to ensure that all new materials and technological developments are safe for people and the environment by 2050. This is done by making them safe and sound right from the design stage. This concept is called Safe-by-Design.

RIVM has made an overview of studies conducted in Europe between 2013 and 2020 into Safe-by-Design. The projects were usually part of the European research program Horizon 2020. RIVM focused on research projects on the safety of nanomaterials. Nanoparticles are very small particles that can behave differently than 'normal' particles and therefore pose a risk.

The overview was commissioned by the Ministry of Infrastructure and Water Management. This has been carried out to support environmental policy of which Safe-by-Design is an important part. The overview can be used to inform and inspire policymakers and the industry, among other things.

The overview describes 74 studies, each of which is summarized and subdivided into four policy themes: research, education, industry and policy (strategic positioning). The results of these studies are presented per theme, such as teaching materials for education and manuals and instruments for industry.

This inventory forms a good basis for formulating follow-up activities that promote the transition to Safe-by-Design implementation.





Reading round-up: nanotechnology for the SDGs, SSbD, graphene classification, new ISO standard

In its latest newsletter, the [Nanotechnology Industries Association](#) highlights a number of recent publications of significant interest to the community:

The paper [Nanotechnology for a Sustainable Future: Addressing Global Challenges with the International Network4Sustainable Nanotechnology](#) looks at the contribution that nanotechnologies can give to the achievement of the UN Sustainable Development Goals (SDGs). The paper, co-authored among others by NIA member the Nano Institute of Sydney University, argues that nanotechnology can accelerate progress towards the SDGs (whose target year is 2030), both directly and through interdisciplinarity. It discusses the role of nano-enabled solutions, technology transfer, circular economy, and includes examples from national strategies.

A paper on **safe- and sustainable-by-design (SSbD)** has also been released, building on the findings of a joint workshop organized by the European Commission's Joint Research Centre (JRC) and Directorate-General for Research and Innovation (DG RTD). The event discussed SSbD-related industrial and regulatory challenges for smart nanomaterials, and its findings, together with subsequent considerations, are presented in [Safe- and sustainable-by-design: The case of Smart Nanomaterials. A perspective based on a European workshop](#).

The **Graphene Council** has released a Graphene Classification Framework, to help address the lack of understanding that remains on the broad group of materials classifiable as graphene. The Framework is the result of an extensive process involving over 100 volunteer experts and was presented at a December 2021 [webinar](#). The document is available [at this link](#).

The **International Standards Organization (ISO)** has released ISO/TS 21357:2022 Nanotechnologies – Evaluation of the mean size of nano-objects in liquid dispersions by static multiple light scattering (SMLS). The [document](#), prepared by Technical Committee ISO/TC 229, provides guidance and requirements for the determination of the mean (spherical) equivalent diameter of nano-objects dispersed in liquids such as particles, droplets or bubbles, using the static multiple light scattering (SMLS) technique. This technique is applicable to a wide range of materials and does not require dilution of concentrated samples.

Stay up to date - [subscribe to the NIA Newsletter](#)

NSC and Nano Risk Governance Publications on Zenodo

Did you know that many more Open Access NanoSafety Cluster and Nano Risk Governance publications can be found on Zenodo?

You can also upload any relevant items to these communities. These include papers, training materials, newsletters, videos, briefings, policies, reports and so on. This platform will give visibility and provide access to your output beyond the lifespan of your projects to help inform ongoing and future research, training and other activities.

- [Zenodo Nano Safety Cluster Community](#)
- [Zenodo Nano Risk Governance Community](#)



SABYDOMA Workshop

A Stakeholder's Perspective of Safe-and-Sustainable-by-Design (SSbD)



The SABYDOMA project, funded by the EU H2020 programme with GA no. 862296, is delighted to invite you to its workshop – **A Stakeholder's Perspective of Safe-and-Sustainable-by-Design (SSbD)** – taking place virtually on **18th February 2022, 10:00h until 13:00h CET**.

Different experts from Academia, Industry, EU Institutions, Standardization and Regulatory bodies, and NGOs will present their understanding and definition of SSbD. This is currently a 'hot' topic which will be enriched by the opinions of those from a diverse range of communities. Furthermore, policy consequences of adopting one concrete "concept" will be evaluated.

Our invited speakers are:

- **Victor Puentes**, Applied Nanoparticles, Spain
- **Mario Pansera**, University of Vigo, Spain
- **Eva Valsami-Jones**, University of Birmingham, UK
- **Sean Kelly**, Nanotechnology Industries Association, Belgium
- **Anne Chloe Devic**, European Chemical Industry Council (CEFIC), Belgium
- **Jana Drbohlavová**, European Commission
- **Xenia Trier**, European Environmental Agency (EEA)
- **Blanca Suarez**, TEMAS Solutions GmbH, Switzerland
- **Denis Sarigiannis**, PARC project

The workshop is open to all interested parties, from the scientific, industrial and whole community wishing to get more insight into SSbD.

Attendance is free upon prior registration.
Please **register by 17th February 2022**.

For more information about the event, visit [the SABYDOMA website](https://www.sabydoma.eu)

DRAFT AGENDA	
18 th February 2022, 10:00h – 13:00h CET	
A Stakeholder's Perspective of Safe-and-Sustainable-by-Design (SSbD)	
10:00	Welcome and introduction to the workshop by Andrew Nelson (University of Leeds, UK)
10:05	1st Legal Workshop on Safe-by-Design: Summary and Output of the workshop by Anthony Bochon (Gil Robles - San Bartolome & Partners, BE)
10:20	External opinions on Sustainability in SSbD: Academia, Industry, Regulators, NGO, Consultancy, Other (A 10min break is included in this session)
	<div> → Victor Puentes, Applied Nanoparticles, ES → Mario Pansera, University of Vigo, ES → Eva Valsami-Jones, University of Birmingham, UK → Sean Kelly, Nanotechnology Industries Association, BE → Anne Chloe Devic, European Chemical Industry Council (CEFIC), BE </div> <div> → Jana Drbohlavová, European Commission → Xenia Trier, European Environmental Agency (EEA) → Blanca Suarez, TEMAS Solutions GmbH, CH → Denis Sarigiannis, PARC project </div>
12:00	Survey of SSbD moderated by Beatriz Alfaro (BNN, AT)
12:10	Break
12:15	Round Table moderated by Ignasi Gispert Pi (Applied Nanoparticles, ES)
12:55	Wrap up and end of the workshop by Anthony Bochon
SABYDOMA project has received funding from the European Union's HORIZON 2020 Research & Innovation Programme under GA no. 862296.	

What is SABYDOMA about?

SABYDOMA's main objective is to develop a new methodology to address the [Safety by Design \(SbD\)](#) challenge as a Control System Problem. Its technological solution is coupling screening to design, i.e. the screening at the point of production feeds back to modify the design of nanomaterials. SABYDOMA will use system control and optimisation theory including the [Model Predictive Control \(MPC\)](#) philosophy, binding SbD from laboratory innovation to the industrial production line and from decision making processes to project governance.

SABYDOMA addresses developments in the safety by design (SbD) paradigm by examining four industrial case studies in detail where the Technology Readiness Levels (TRLs) will advance from 4 to 6. Each TRL activity progresses from being lab based at TRL₄ to being industry based at TRL₆. The TRL₄ activity involves only innovation with regular industrial communication whereas the TRL₆ activity involves industrially located activities with innovation communication.

One of the novel themes of this study is to use system control and optimisation theory including the Model Predictive Control (MPC) philosophy to bind the whole subject of SbD from laboratory innovation to the industrial production line and from decision making processes to project governance. An equally important innovative step is the building of high throughput online platforms where nanomaterial (NM) is manufactured and screened at the point of production. The screening signal controls the NM redesign and production in a feedback loop

Nanosafety Training School: Towards Safe and Sustainable by Design advanced (nano)materials

15 - 20 May 2022

About the School

The Training School will take place in the historic centre of Venice, Italy from 15 - 20 May 2022. The school aims to transfer State-of-the-Art knowledge on a variety of topics from key experts to the new generation of nano-environmental, health and safety professionals, using interprofessional education in hands-on sessions.

Join our school and gain more knowledge on multidisciplinary expertise!

Topics

- Historical perspective of NanoSafety
- Transition from Safe to Sustainable by Design
- Industrial Perspective
- Physical-chemical characterization
- Materials: properties and sustainability
- Grouping & Read Across Approaches
- Modelling
- Hazard
- Exposure
- Risk Governance
- Case Studies: 1. Decision and Support for Safe & Sustainable by Design, 2..., 3... - Interactive session with attendees

Benefits from Attending the School

- Learn the latest trends in NanoSafety gaining an in-depth interdisciplinary understanding of the key topics
- Engage in a dialogue with peers and key experts
- Benefit from a variety of additional networking opportunities such as a boat trip in the Venetian Lagoon and a social dinner

Who should attend?

- Early-stage researchers
- PhD students and Post Docs
- Senior researchers
- Industry
- Governmental Agencies
- Medical Personnel
- Anyone interested in Safe Nanotechnology, Risk Assessment and Nano-Medicine

Venue

Venice, Italy

The core school programme will take place in the historic Auditorium Santa Margherita

Organizing projects:



Contributing projects:





“Nano-week” & NanoCommons Final Conference

co-organised with EU NanoSafety Cluster projects
Cyprus, 20 – 24 June 2022

The **NanoCommons EU Project** consortium, in collaboration with the **EU NanoSafety Cluster projects**, is delighted to announce the **“Nano-week” and NanoCommons Final Conference**, to be held this summer, in Limassol, Cyprus (with virtual participation also possible for selected sessions).

The conference and associated events (e.g., Young NanoSafety Researchers event, Training events from across the nanosafety projects, EU-US CoRs meeting, NanoInChi CODATA meeting, NSC meeting) will take place between **20-24 June 2022**.

The conference theme is **“Evolution of nanosafety and materials sustainability as we transition into Horizon Europe”** and the main topics are:

1. Safe-and-Sustainable-by-Design of (nano-enabled) products & processes
2. New modelling methodologies and nanoinformatics approaches
3. Data Management – Databases – FAIR data
4. Nanomaterials go advanced – emerging challenges and foresight
5. Emerging “hot” topics in nanosafety

For further details on topics and sub-topics click [here](#).

Call for Abstracts: The **abstract submission** for oral presentations is **now OPEN** until **25th February 2022**. If you wish to take an active part in this conference, please submit your abstract by clicking this [link](#).

Poster abstracts can be submitted up to **31st May 2022**.

The **Scientific Committee**, in charge to review the abstracts is a group of experts from the **EU Projects** that constitute the **NanoSafety Cluster** and will be **led by the NanoCommons Coordinator**, [Professor Iseult Lynch](#). The list of the Scientific Committee members is available [here](#).





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.

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www.nanosafetycluster.eu