

## Welcome to Issue #27 of our NSC Newsletter

As always, we'd like to thank everyone who contributed to this issue. Your input has been HUGELY appreciated. The list of [CONTENTS](#) can be found on the next page.

Our NSC Coordination Team—Éva Valsami-Jones, Flemming Cassee, and Andreas Falk—are not quite back from holidays, and so business will resume with a CT update in the next NSC Newsletter.

Meanwhile, we hope you've been able to enjoy getting out and about and seeing colleagues after so many months of on-and-off lockdowns and constraints. Numerous participants attending project events in person as opposed to virtually have valued these opportunities, and the difference in the quality of engagement and interaction has been remarked on by many of us.

The benefits of face-to-face meetings were particularly evident during NanoWeek 2022, which is highlighted in the first half of this issue. From the 20th to 24th June, members of the NSC community and colleagues came together in Limassol, Cyprus, for what was to be a highly engaging and enjoyable event. The week was led by NanoCommons in tandem with the organisation of its final conference against the backdrop of sun, sea, sand and science. Travellers to Limassol faced the challenges presented by travel chaos, delayed flights, missed connections, and luggage going on holiday to other distant parts; but all of this was soon forgotten as people came across familiar faces, met old and new colleagues, discovered that people look exactly the same as or indeed completely different from how they appear on Zoom, and then immersed themselves in a stimulating, varied and dynamic programme. The experiences of different NSC projects are accompanied by images of sessions and social events in our special [NanoWeek 2022 feature](#).

Following this, we present the reports and updates from a wide range of [NSC projects](#) showcasing their recent developments and project outputs. In other news, our newsletter reports from SweNanoSafe and Iriss in Sweden, before introducing the Cefic-LRI Microplastics Cluster of projects. Then follows a not-to-be-missed [publications section](#) with news of papers from our projects; details of an opportunity to publish in a special issue of Nanomaterials, titled "Towards a Safe Nanotechnology: Understanding and Controlling Immunomodulatory and Toxicological Properties of Nanomaterials"; further papers of interest; and details of a newly published ISO.

Are you thinking about a change? Have a look at the latest [job opportunities](#) at CSIC and INL in Spain.

Finally, don't miss the [events section](#), where you can find the registration details for the [CHARISMA Raman School 2022](#) as well as other event announcements, including news of the NMBP-13 Projects' Final Conference.

We hope you enjoy reading this issue and find it useful and informative.

Best wishes  
Lesley Tobin  
[news@nanosafetycluster.eu](mailto:news@nanosafetycluster.eu)



**We URGENTLY need your help!**

**Once again, we are appealing to the NanoSafety Cluster Projects  
to help fund this newsletter and related activities.**

**Funding for the NSC Newsletter ended in June 2022**

Is your project able to help for any length of time—3 months, 6 months or even 12 months?  
If so, please contact Lesley at [news@nanosafetycluster.eu](mailto:news@nanosafetycluster.eu)

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# Overview

To mark the culmination of the NanoCommons project and its final conference, the whole nanosafety community came together in person and online for NanoWeek 2022, which took place in Limassol, Cyprus from 20-24 June 2022. Led by the NanoCommons project and 18 other nanosafety projects, this fantastic event was one to be remembered!

### Conference theme:

The conference, titled **“Evolution of nanosafety and materials sustainability as we transition into Horizon Europe”**, encompassed the following topics:

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

The conference program can be consulted [here](#) and the book of abstracts is available [here](#). For more information about the conference, visit the [NanoCommons page](#).

### The Scientific Committee

The programme organisers and abstract reviewers comprised a group of experts from the NSC projects, led by the NanoCommons Coordinator, [Professor Iseult Lynch](#), seen welcoming the participants. in the image left.

### Participating projects:

A large number of NSC projects , represented by their logos in the bottom right, supported and participated in NanoWeek.

Many of these projects have contributed accounts of their experiences to this Newsletter’s special feature on the event.

Read on!.....





## SABYDOMA @ NanoWeek 2022

A number of SABYDOMA partners took part in NanoWeek while three members were part of the Scientific Committee: Andrew Nelson (UNIVLEEDS) (centre in image right), Maria Dusinska (NILU), and Haralambos Sarimveis (NTUA).

SABYDOMA reports: "The hybrid event was very well visited with 250 attendees from the international nanosafety community interested in the breadth of activities compiled by the conference – from the Young Nanosafety Scientists speed dating (which was a massive highlight for all participants), to the technical sessions, panel discussion and poster session, to the training events, the [EU-US CoRs meeting](#), the [NanoInChi meeting](#) and a joint [EU NanoSafety Cluster meeting](#). Next to that, many projects held their consortium meetings on the final day.



One of the highlights of NanoWeek2022 was the *outdoor poster session* with food and drinks in the amazing conference location, next to the beach.

[Watch the poster session video](#)

After such a long time in online meetings, it was fantastic to meet so many from the community in person again and have some offline discussions. All-in-all, the conference was wonderful and we made great memories including some midnight-swimming in the sea before going to bed.

In addition to the overall networking activities, the SABYDOMA project was among the many projects represented through:

- 6 poster presentations:
  - Evangelos Papaioannou from [Cnano](#) with their novel electroplating technique (poster 52)
  - Andrew Nelson from [UNIVLEEDS](#) (posters 77, 78 and 79) – DOIs: [10.5281/zenodo.6793392](https://doi.org/10.5281/zenodo.6793392) / [10.5281/zenodo.6793413](https://doi.org/10.5281/zenodo.6793413) / [10.5281/zenodo.6793430](https://doi.org/10.5281/zenodo.6793430)
  - Ignasi Gispert Pi from [APPNPS](#) (poster B5) – DOI: [10.5281/zenodo.678683](https://doi.org/10.5281/zenodo.678683)
  - William Stokes from UNIVLEEDS (poster A8) – DOI: [10.5281/zenodo.6786857](https://doi.org/10.5281/zenodo.6786857)
- 1 oral presentation of Philip Doganis and Haralambos Sarimveis (from [NTUA](#)) introducing SABYDOMA's Safety-by-Process Control Concept – DOI: [10.5281/zenodo.6786804](https://doi.org/10.5281/zenodo.6786804)
- Participation of Philip Doganis in the *Decision Support System (DSS) pitch session* presenting the DSS tool and the subsequent *round table* on how to coordinate and unite our efforts to bring our tools to the industry.
- Egon Willighagen, from University of Maastricht, showcased the Transnational Access (TA) project that SABYDOMA as with NanoCommons on integrating eNanoMapper and NanoCommons Knowledge Base via APIs.

Following this, on June 24th, SABYDOMA held a *thematic meeting* in a hybrid format, as reported [here](#), where we were able to update about the activities in the last months and discuss the upcoming developments.

Additionally, all coordinators of the NMBP-15 sister projects ([ASINA](#), [SAByNA](#), [SABYDOMA](#), [SbD4Nano](#)) joined in a private session for internal discussions and alignment in the upcoming months.

*Image right: NMBP-15 Project Coordinators*





## NanoPAT @ NanoWeek 2022

During NanoWeek, the NanoPAT project was represented through:

- 1 poster presentation (Evangelos Papaioannou from Cnano with their novel electroplating technique (poster 52)) and
- 2 oral presentations
  - Marko Simic from BRAVE presenting the *Optofluidic Force Induction as a Process Analytical Technology*, and
  - Deven Joshi from TEMASOL showcasing the Transnational Access (TA) projects that NanoPAT is running with NanoCommons on *data management solutions for inline/online processes*).

NanoPAT partners appreciated the great opportunity to meet some of the project partners and to get to know each other better. The offline and informal discussions and networking enabled everyone to find out about current and forthcoming developments, as well as engage with different members of the nanosafety community on topics of mutual interest!

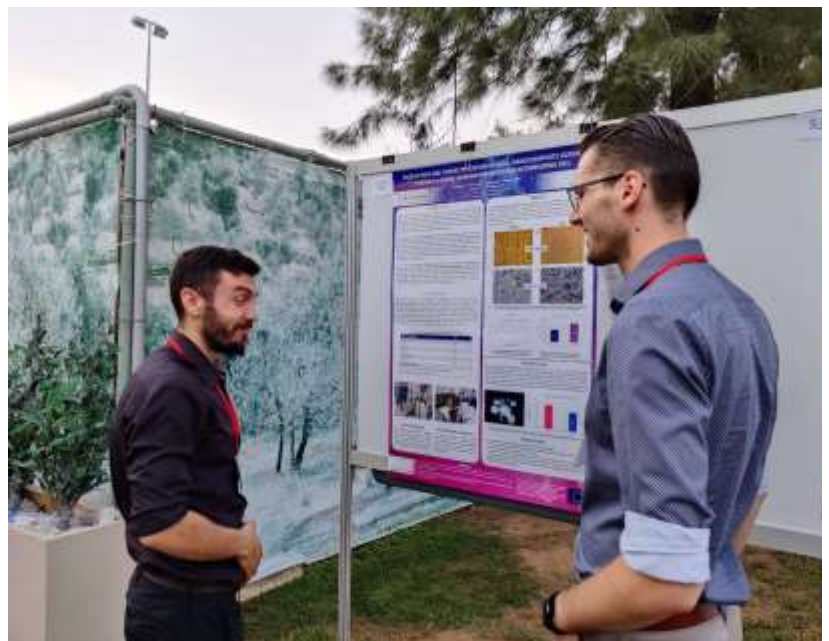


*Images above:*

Images above: Deven Joshi from TEMASOL (left) and Marko Simic from BRAVE ANALYTICS (right) delivering presentations

*Image right:*

Evangelos Papaioannou from Cnano with the novel electroplating technique (poster 52)





# HARMLESS @ NanoWeek 2022

Alongside its NMBP-16 sister projects, the HARMLESS project took the opportunity to showcase its work and present its developments through:

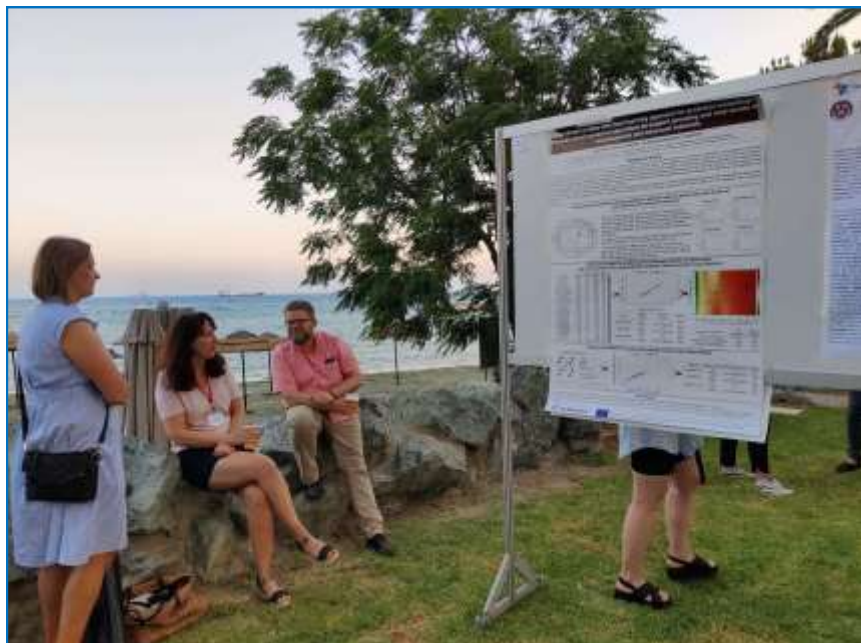
- 5 poster presentations:
  - Eugene van Someren and Susan Dekkers, from TNO, explaining the conceptual design of *HARMLESS Decision Support System* (poster 83) – DOI: [10.5281/zenodo.6806190](https://doi.org/10.5281/zenodo.6806190)
  - Veronique Adams and Beatrice Salieri, from TEMASOL, showing the *HARMLESS SSbD framework* (poster 84)
  - Agnieszka Gajewicz, from Gdansk University, on *numerical algorithms supporting grouping and read-across of nano and advanced nanomaterials* (poster 111)
  - Sian Brooks, from Swansea University, on the *potential genotoxic effects of industrially-relevant multi-component nanomaterials* (poster 72)
  - Carola Voss and Tobias Stöger, from HMGU, on *the course of lung inflammation and injury caused by nanoparticle inhalation* (poster 76)
- 1 oral presentation (Sarah Sos Poulsen, from NRCWE, on *engineered nanomaterial-relevant AOPs*) – DOI: [10.5281/zenodo.6806067](https://doi.org/10.5281/zenodo.6806067)
- Sarah Sos Poulsen and Ulla Vogel, from NRCWE, delivered training on *Adverse Outcome Pathways (AOPs) on nanomaterials* – DOI: [10.5281/zenodo.6806125](https://doi.org/10.5281/zenodo.6806125)
- Wouter Fransman and Susan Dekkers (from TNO) participated in the *Speed Dating Session on Decision Support Systems for SSbD* presenting HARMLESS upcoming DSS tool. Furthermore, Wouter was a panellist in the subsequent *round table* on how to coordinate and unite our efforts to bring our S(S)bD tools to the industry.
- Mario Pink (on-site) and Andrea Haase (online), from BfR, gave a training on the *integration of nano-related data, linking SOPs via instance maps to electronic data management systems*, together with partners of other NMBP-16 projects

Additionally, HARMLESS partners chaired a number of the sessions in the conference:

- Tobias Stöger, from HMGU, chaired the session "*Hazard, Exposure and SSbD*" on June 21<sup>st</sup> and June 22<sup>nd</sup>,
- Ulla Vogel, from NFA, chaired the EU-US nanoEHS COR session on "*Risk Management and Control*" on June 23<sup>rd</sup>.

HARMLESS commented: "Finally, on June 20th, the three NMBP-16 projects (DIAGONAL, HARMLESS, SUNSHINE) held an *NMBP-16 Ambassadors meeting* in a hybrid format, as reported [here](#), where we were able to get to know each other for the first time in person, align our work, exchange information with each other and define the future interactions between the three projects."

"It was a great opportunity to meet the project partners, to better get to know each other, to have offline discussions on the upcoming developments, and to interact with the nanosafety community on different topics!"





## DIAGONAL @ NanoWeek

Members of the Diagonal project represented their initiative during NanoWeek, with an oral presentation delivered by Andreas Stingl—stepping in for Patricia Farias—entitled, “Towards safety and sustainability in scalable production of semiconducting nano and non-nanomaterials: Zinc oxide – a case study” (DOI: [10.5281/zenodo.6793572](https://doi.org/10.5281/zenodo.6793572)).

At the Poster Pitch session, Amaia Soto presented her poster “Nanosized copper-based catalyst for automotive: physicochemical characterization” (DOI: [10.5281/zenodo.6772583](https://doi.org/10.5281/zenodo.6772583)) and James Ede presented “Life-Cycle Risk Assessment of Graphene Functional Fabrics” (DOI: [10.5281/zenodo.6786748](https://doi.org/10.5281/zenodo.6786748)).

On Friday, 24 June, DIAGONAL then held its Consortium Meeting on site, parallel to several other project meetings. Organised in a hybrid format, roughly 35 participants attended in person, with another 15 taking part online.

DIAGONAL commented: “It was an unforgettable week, sharing knowledge on [#nanosafety](https://twitter.com/nanosafety) with others from EU NanoSafetyCluster projects through oral presentations, outdoor poster sessions, poster pitches, and networking sessions.”

“It was great to see different approaches on how to design new materials and technologies [#safe](https://twitter.com/safe) & [#sustainable](https://twitter.com/sustainable).”

After such a long time in online meetings, it was fantastic to meet so many from the community in person again and have some offline discussions. All-in-all, the conference was wonderful and we made great memories including some midnight-swimming in the sea before going to bed.

The week ended with our Consortium Meeting. Time flies - the first year of DIAGONAL has already passed! Watch our short [video](#) and see if you can spot yourself and your colleagues in Limassol!”

“Thank you to NanoCommons for organizing it, and to all the other projects involved!”



Image above: Susanne Resch (BNN) delivers a presentation of DIAGONAL WP2 developments



## SUNSHINE @ NanoWeek

Various SUNSHINE partners took part in NanoWeek and delivered presentations, chaired sessions, presented posters and hosted a stand in the e-infrastructure speed dating session of the NMBP-15 and -16 projects. We discussed how to coordinate and unite our efforts and bring them to use in the industry with the other NMBP projects.

The SUNSHINE project additionally participated in the NMBP-16 Ambassadors meeting with members of the HARMLESS and DIAGONAL projects (see below). Further information from the event will be added to the SUNSHINE [e-learning section](#) as soon as it becomes available.

### NMBP-16 Ambassadors' Meeting at NanoWeek 2022

The three EU-funded NMBP-16 projects **DIAGONAL, HARMLESS & SUNSHINE** joined forces to address the challenge of applying and extending the S(S)bD concept to multi-component advanced nanomaterials. **NMBP-16 Ambassadors** for specific Task Forces were nominated, to facilitate the inter-project collaboration and knowledge exchange. As many of the NMBP-16 project partners were attending the NanoWeek 2022, they took the opportunity to run a NMBP-16 Ambassadors Meeting on Monday, 20 June 2022. After purely online meetings until now, it was a great chance to finally meet some other Ambassadors face to face and get to know each other in person. The meeting was organized to further align the work of the projects, exchange information with each other and define the future interactions between them.

After a short introduction of Otmar Schmid (HARMLESS' coordinator), the different Task Forces on the topics :  
(i) Stakeholder Engagement, (ii) Grouping and Read-across, (iii) Database, (iv) Risk Management (incl. Exposure Assessment & Risk Assessment tools), (v) MCNMs (Meaning of MCNMs, case study comparison and sector specific transparency), and (vi) Hazard Assessment

The groups discussed their progress in separate break out rooms, providing updates on their latest activities and defining the upcoming ones. In addition to this meeting, the Ambassadors had the chance during the whole of NanoWeek2022 to further interact with each other, as well as with other [EU NanoSafety Cluster](#) projects.



*Image:* NanoWeek participants are treated to a rehearsal of Shakespeare's 'The Tempest' at Ancient Kourion.

*Image Credit:* Susanne Resch, BNN





## ISQ @ NanoWeek

ISQ, Portugal, a partner in the DIAGONAL project, appreciated the opportunity to take part in different sessions at NanoWeek. Carla Martins, PhD said: "As this is one of the most important events on the topic of nanosafety, it was possible for us to consolidate knowledge and acquire more, which was a very enriching opportunity."

In addition, project consortium meetings were also held, where all developments were disclosed, including in the field of nanosafety where ISQ operates. Finally, the face-to-face meeting with partners was also a way of strengthening connections and planning future activities."

The image below is a compilation of the ways in which ISQ represented its work during the event.



Rita Alberto



Cristina Matos



João Laranjeira



Carla Martins





## Summary of the Breakout Session on the Ecotoxicity and Human Health CORs

Chairs present: Susana Loureiro (EU) and Olga Tsyusko (US), and Arno Gutleb (EU)

Olga Tsyusko, Associate Professor  
University of Kentucky, Department of Plant and Soil Sciences  
[olga.tsyusko@uky.edu](mailto:olga.tsyusko@uky.edu)

During the breakout session of the two combined US-EU Nano EHS CORs, Ecotoxicity and Human Health, multiple strategies in the areas of environmental and human nanotoxicity were discussed. First of all, it has been noted that in the last decade, there has been a shift in the approach to the risk evaluation of the nanomaterials from assessing the consequences after they have been released to the environment to the safety-by-design strategy. This strategy allows to design, develop, test and, if necessary, re-design nanomaterials prior to their release to the market. To make the new products safer, there are multiple approaches with one of them being the use of biodegradable materials with a very low or no toxicity. Some examples of such materials are agricultural byproducts (e.g., chitosan, zein, cellulose) or natural clay minerals. Among other safer-by-design approaches discussed were re-design of the existing products by replacing the metal cores with non-metals or modifying surface chemistry of the nanomaterials with encapsulation or functionalization to increase their stability.

During discussion it has also been emphasized that the experimental exposure scenarios to evaluate and predict risks of the nanomaterials became more complex and realistic. Several research groups in US and EU have been conducting studies using mesocosms to account for environmental transformations of nanomaterials, their fate and transfer through the food web and the effects on multiple organizational levels. Among toxicity endpoints studied, in addition to the standard toxicity testing under OECD guidelines, there was also discussion about incorporation of other more sensitive endpoints, e.g., multigenerational effects, genomic, proteomic and epigenetic signatures. To increase realism of the exposure, the point was brought up regarding the newly developed products containing nanocomposites and, that in the environment, organisms are exposed not to single chemical substances but to mixtures of nanomaterials as well as in combination with other biotic and abiotic stressors. Classifying advanced and nanocomposite materials into different categories might be more informative when discussing toxicity of those mixtures. The increase in complexity of the exposure scenarios and incorporating mixtures makes the risk evaluations from nanomaterials even more challenging.

The large part of the discussion was focused on the One Health Approach, specifically that Ecotoxicity and Human Health toxicity studies of nanomaterials are often segregated from each other while both should be included in the risk assessment. Critical point was brought up regarding different definitions of One Health, with one being that besides obvious exposure scenario/pathway (e.g., occupational), humans can be also exposed to nanomaterials through the environment. As example can be consuming crops, grown on the soils amended with biosolids that contain nanomaterials. According to the other definition, there is also an indirect effect of nanomaterials on humans, where, nanomaterials affect living organisms in terrestrial and aquatic environments with a potentially adverse effect on their community and population levels. For instance, a nanopesticide, in addition to killing the targeted pest, can potentially also have untargeted adverse effects on beneficial soil invertebrates such as earthworms, which are critical for soil structure, water and nutrient cycling, plant growth, *aka* soil health, and this would result in indirect effects on humans, such as decrease in plant yield. Overall, during this discussion it became more evident that both of these interpretations of One Health concept are critically important and the toxicity testing should be approached from the life-cycle analysis of the materials in the environment with the effects on the environment and on humans directly and indirectly.

One important point discussed was the need of the Adverse Outcome Pathways, specifically the importance of knowing key initiating events (KIE), knowledge of which can be necessary in order to re-design nanomaterials with the goal of decreasing their toxicity. It can be very difficult to identify KIE in nano ecotoxicity *in vivo* studies. These studies can be used to determine overall environmental safety of the nanomaterials for targeted and untargeted organisms and from such studies, it is also possible to identify potential molecular pathways, key genes, protein networks affected by the exposure. However, it is not sufficient for KIE, and the *in vitro* cell studies, now turning into more complex 3D structures (e.g. organ on a chip) might be more informative for tracing KIE.

While summarizing outcomes from this session, we also discussed what can be done to better integrate ecotoxicity and human health research between US and EU research communities. As reflection of this meeting, it became clear that the topic of environmental and human nanotoxicity fits well with the priorities and objectives of many working nano groups in US and EU, such as INFRAMES, DIAGONAL, and NanoHarmony and others. As the chairs of the Ecotoxicity and Human Health Nano EHS COR we will be reaching out to these groups to work together in workshops and webinars. Given the disconnect which exists between Ecotoxicity and Human Health and with the goal of educating research communities about One Health approach, training on One Health with Working Group A (WGA) Education in NanoSafety Cluster (NSC) will be developed. Finally, the first step in bringing US and EU nanotoxicity research will be our session on "Nanoparticle biological interactions and their responses" at SETAC North America in 2022 in Pittsburgh, PA, USA.





### 3. What kind of topics could be discussed in a roundtable?

Who should manage the alignment of projects	Highlight victories that really helped stakeholders	SSbD, lack of data, failure to exploit project produced data, close mindedness of regulatory scientists
How to help industry	How to get regulation of nm exposure in EU	Practical cases
Real world problems	Citizen engagement	Framework, body/entity for governance, test guidelines
Societal aspects	Discussion on the screening of new materials that may cause a risk	How to initiate and run a series of balanced discussions with the broad public to inform them, and to answer specific questions that are of concern for them.
The future of the community in horizon Europe framework	How do we create (topics and format) a sustainable network / house of nanospecialists	Harmonisation
Practical cases to use the governance house	How best to interact among different stakeholders	How results of projects can be exploited after project end (user friendly, transparent, one source)
Integration of all aspects of risk in the risk management How to communicate with SH so this will be useful SSbD	Harmonization of NM characterization/testing	Harmonization of NM characterization/testing
- how can all stakeholders be involved (also involve & inform public and give them a vote)- prioritisation of available information. What needs to be communicated along all involved stakeholders?- different roles and responsibilities	How can sustainability and survival of results be organized after projects have ended?	Will a portal survive?
Can SSbD be integrated and how?	How could Users really be supported when using Tools, Data...	How to avoid specific reputations for nanomaterials, size and surfaces matters but there is no distinct cut off to justify nanomaterials to be treated social
reliability of data; disconnect between regulators, scientists, industry and public; regulators and funding bodies should initiate contacts and meetings with scientists, industry and public in each country to understand the needs		

### 4. Is there anything missing in our approach?

Cost benefits of governance	No	Emphasis on transnational collaboration.
Building a strong lobby with politicians and key stakeholder communities	Involving also the public	Young scientists training
The nano-specific needs will be lost in the current funding framework which comprises a wide pool of materials and chemicals.		



Cntd → The NMBP-13 Projects @ NanoWeek

### 5. How can your work be used to support effective risk governance and what is needed to make that happen?

Data mining journal paper	Show benefits. Don't just ask for our data	Unique platform for communication
We have made healthbased occupational exposure limits for specific nanomaterials	Standardisation and databases	Running transparent processes in the creation of governance structures
Include an ethical impact assessment module in the risk governance framework. Practical cases and linking with co-creation	Address regulatory needs	Harmonisation of methods
-Stakeholder engagement - Contributing to SbD4Nano project. Guidelines on SbD integration in the risk governance framework. Collaboration with NMBP 13 projects would be of great benefit	Concept for "what will happen after end of the Projects"	No
Funding to develop reliable methods and biological models, which are needed to produce reliable data and reliable in silico models		

### The Posters

Four joint NMBP-13 posters were presented during the evening poster session, and are reproduced below:

## Risk Governance of Nanomaterials

**The Challenge:** Nanotechnology impacts a broad range of industries and applications. Yet, the interaction of engineered nanomaterials with the living environment is complex and is marked by uncertainty and ambiguity. As a result, there is an urgent need to develop appropriate governance structures, to ensure the trust of all stakeholders.

**The Approach:** Three large independent European projects are collaborating in this endeavour. The partners involved have a long history of research to understand the impacts of nanomaterials on human health and the environment, and have participated in all major European and national projects dealing with these topics.

**NMBP-13 Cluster Three European Projects Working Together**

Although each of the projects has its own unique approach and objectives, they share common goals and visions which will be strengthened by constructive cooperation involving all stakeholders across Europe.

**Expected Outcomes**

- A Nanotechnology Risk Governance Portal (NRGP):** An NRGF that is built on sound scientific data and informatics tools. The data and tools, SOPs and guidelines that are generated will be validated, standardized, as well as progressive, and will be made accessible to all stakeholders. The creation of the portal aligns with the workplans of the three projects.
- A Nanotechnology Risk Governance Framework (NRGF):** An operational, trans-disciplinary NRGF that integrates exposure, hazard and risk assessment tools with those assessing ethical, legal, social, and environmental aspects, and further supports responsible research and innovation (RRI).
- Organisation for the Governance of Nanotechnology-related Risk:** An organisation that implements the NRGF and engages with a wide stakeholder base in a proactive, participative, and transparent manner. This will address new issues as they may arise. The organisation has the goals of knowledge sharing and access to information which will be supported by the NRGF.

**The Role of Stakeholders in the Development of Nano Risk Governance**

Following extensive stakeholder engagement, including regulatory agencies, industry, NGOs, international organisations and academia, a 'blueprint' for a new organisation is being developed and refined.

Please help us perfect this blueprint by completing our online survey using the QR code. What form do you think this organisation should take?

**NMBP-13 Collaboration:** 3 projects; 82 partners; 17 EU countries and Brazil, India, Iran, Switzerland, South Africa, Republic of Korea, the UK, and the USA; Budget: € 18.3 million; Duration: January 2019 – February 2023  
[www.stre4nano.eu](http://www.stre4nano.eu) | [www.nanorigo.eu](http://www.nanorigo.eu) | [www.riskgone.eu](http://www.riskgone.eu)

## Organising for the Governance of Nanotechnology-related Risk

Marie Valerine Florin<sup>1</sup>, Rob Akkers<sup>2</sup>, Francesca Isgnoli<sup>3</sup>, Monique Gommersdorf<sup>4</sup>, Jarnek Scott-Fordmann<sup>5</sup>, Lorenza Serchi<sup>6</sup>, Dalia Antoniet<sup>7</sup>, Arto Uusikainen<sup>8</sup>, Andrea Fancari<sup>9</sup>

**A Risk Governance Organisation**

The EC Chemical Strategy for Sustainability, the Green Deal, and other initiatives in Europe, indicate an ambition regarding safety, sustainability, and circularity of chemicals, towards a net-zero environment.

Innovation brings potential for economic growth and addressing societal and environmental challenges. However, innovation often comes with high uncertainty regarding its risks. Concerns are raised on the access of all important actors to high-quality data, technical risk assessment, public acceptance and acceptance, and regulatory harmonisation and effectiveness, among other aspects. Improvements are needed regarding how risks to human health and the environment are assessed, managed and communicated.

To address these challenges, three NMBP-13 projects of the NMBP-13 call (NANORIGO, RISKGONE and Gov4Nano) are working to improve the governance of nanomaterials in Europe.

A 'blueprint' for a new organisation was developed following extensive stakeholder engagement including regulatory agencies, industry, NGOs, international organisations and academia. This blueprint describes the form and function of the organisation, which encompasses technical, economic and social aspects.

It is now being refined and support sought for either:  
 1. an independent, permanent 'House' established as a portal that provides access to a continuously developed library of tools and data sets, together with roundtable services and activities to provide guidance to members of the House; or  
 2. a light 'taskforce' charged with developing opinion and advice in response to emerging issues that have been identified by members of the taskforce or through an external request.

**Mission and Goals of the Organisation**

**Activities of the Organisation**

Please help us refine the blueprint by completing this online survey

**\* EURL, Lausanne, Switzerland; <sup>2</sup> NOM, Edinburgh, UK; <sup>3</sup> University of Foggia, Foggia, Italy; <sup>4</sup> ANM, Utrecht, Netherlands; <sup>5</sup> University of Aarhus, Aarhus, Denmark; <sup>6</sup> IIST, Esch-sur-Alzette, Luxembourg; <sup>7</sup> FactorSocial, London, Portugal; <sup>8</sup> FOM, Breda, Finland; <sup>9</sup> ANM, Rome, Italy; [marie.valerine.florin@ec.europa.eu](mailto:marie.valerine.florin@ec.europa.eu)**

[www.gov4nano.eu](http://www.gov4nano.eu) | [www.nanorigo.eu](http://www.nanorigo.eu) | [www.riskgone.eu](http://www.riskgone.eu)

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 814425, 814401 and 814530



Cntd → The NMBP-13 Projects @ NanoWeek

### Nanotechnology Risk Governance Framework (NRGF) – adaptation of the IRGC approach

**NANORIGO** **RISK GONE** **Gov4Nano**

Antti Ståhlman\*, Marie Valentiné Flörke†, Aramba Bellestero†, Piet Selker†, Anna-Kaisa Voutilainen†, Panagiotis Igaridis†, Dalia Antunes†, Keld Alstrup Jensen†

**BACKGROUND**

It has been widely acknowledged that the **risk governance of nanotechnology** should be based on a clear understanding of RIA, its management practices, and the societal risk perception by all stakeholders. The Risk Governance Framework of the International Risk Governance Centre (IRGC) describes processes aiming to provide and structure scientific evidence about a risk in a societal context.

The **NANORIGO**, **RiskGONE** and **GOV4NANO** projects consider this framework along with the ISO 21505 and ISO 31000 standards modified to cater to fit nanotechnology, its products and complex frameworks. The NRGF provides guidance for early identification, assessment, management and communication of risks, involving multiple stakeholders, considering the social impacts of the various uses of nanoproducts, and coupling risk benefit assessment.

It integrates selected **methods, tools and best practices** that can improve or complement existing practices for safety and risk management. **Stakeholder needs**, as continuously identified, are incorporated in the NRGF to enable tailored development for multiple stakeholder groups. The NRGF comprises of interlinked steps and cross-cutting core functions and serves as the integrator of important concepts and principles, tasks and illustrations. The framework is converted to **web-based solutions** also including the use of FAIR data to facilitate its' interactive and flexible use.

**GOVERNANCE**

Refers to the actions, processes, traditions and institutions by which authority is exercised and decisions are taken and implemented.

**INVOLVEMENT**

Involves multi-disciplinary sciences and multi-stakeholder approaches.

**FRAMEWORK**

For risk governance this is based on a defined and structured process to addressing risk in a comprehensive and holistic manner.

**A future proof, operational Nano Risk Governance Framework**

- Based on the IRGC Framework
- Integrates scientific data and operational tools into a relevant and reliable and transparent decision framework, trusted among stakeholders
- Aimed at a participative and pro-active form of governance
- Based on existing infrastructure & across all relevant domains i.e. chemicals, biocides, consumer products, food, medicine
- Connecting key organisations and stakeholders (EU and global)

Please help us refine service delivery by completing this **online survey**

**French Institute of Occupational Health, Tampere, Finland; IIRB, Lausanne, Switzerland; IIRGC, Palermo, Spain; IDIALOG, Stuttgart, Germany; 'Università Ca' Foscari', Venice, Italy; Paoli-Sorok, Lisbon, Portugal; 'National Research Centre for the Working Environment, Denmark**

[www.nanorigo@eu](mailto:www.nanorigo@eu)

**NMBP-13 Collaboration:** 3 projects, 82 partners, 17 EU countries and Brazil, India, Iran, Switzerland, South Africa, Republic of Korea, the UK, and the USA. **Budget:** € 18.3 million. **Duration:** January 2019 – February 2023

[www.gov4nano.eu](http://www.gov4nano.eu) [www.nanorigo.eu](http://www.nanorigo.eu) [www.riskgone.eu](http://www.riskgone.eu)

\*These projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No-814425, 814401 and 814530

### Data Management for Nanotechnology Risk Governance

**NANORIGO** **RISK GONE** **Gov4Nano**

Martine Bakker, Damjana Orobnic, Nina Jelaskaova, Antreas Afantidis, Egon Wifflighagen and Jesuit Lynch

**Data management core group: overall task and needs**

The three NMBP-13 projects have a common data management core group, with delegates from each of the three projects. Joint milestones were defined for the areas depicted below:

- Data management plan**
  - covering all assets & all types of data
  - how we collect them
  - whereby & where
  - agreement on 3 projects
- Quality Process for data sharing of datasets**
  - consensus & development of standards
  - implementations of both & workflow
- Methods to support data sharing**
  - Integrated datasets will be created using agreed standards
- Interoperability and integration**
  - through automation of parts of existing tools and development of "bridge" tools

When **NANORIGO** is focused on defining concepts and user needs, **RiskGONE** and **GOV4NANO** the emphasis is on operationalisation / implementation of nanosafety data and FAIR solutions. Together, the 3 projects cover the whole data management spectrum to enable the risk governance of nanomaterials and provide knowledge in a useful format for implementation in the Nanomaterials Risk Governance Framework (NRGF).

**Joint Milestone: Glossary of key terms related to data management**

**Joint Milestone: Prioritisation of databases to make interoperable**

- Inventory of databases – current / maintenance / API access
- Inventory of data uses (through the NRGF)
- Analysis and synthesis of priority list in progress

**Joint Milestone: Agreed actions and criteria for reporting and verifying / validating older project datasets for re-usability**

- Optimization and automation of workflow
  - for evaluation of dataset quality, completeness and fitness of purpose
  - for re-use by diverse end-users and stakeholders

Contributors from NANORIGO, Gov4Nano, RiskGONE, NanoCommons, NanobioNet and Nanomaterials/IT projects.

**Joint Milestones – to align each project's data management plans**

**We need your help**

Please complete this online survey to assist in the refinement of future services

**Joint Plan for jointly created outputs & NRGF-panels**

**NMBP-13 Collaboration:** 3 projects, 82 partners, 17 EU countries and Brazil, India, Iran, Switzerland, South Africa, Republic of Korea, the UK, and the USA. **Budget:** € 18.3 million. **Duration:** January 2019 – February 2023

[www.gov4nano.eu](http://www.gov4nano.eu) [www.nanorigo.eu](http://www.nanorigo.eu) [www.riskgone.eu](http://www.riskgone.eu)

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 814425, 814401 and 814530.

The Survey

The three projects invited all NanoWeek attendees to take part in an ongoing survey designed to better understand how the needs of different stakeholders can be addressed through the outputs of the three projects and inform the development of new approaches to the risk governance of engineered nanomaterials (ENMs).

We invite you to take part in this survey using the url below or the QR code on the right.

[https://bit.ly/RiskGovernanceNano\\_Form](https://bit.ly/RiskGovernanceNano_Form)



All responses will remain confidential, and no specific comments will be attributed to any individual. While we welcome you to provide contact details and the opportunity to follow up with you, this is not mandatory.



CUSP

## CUSP @ NanoWeek

### The European Research Cluster to Understand the Health Impacts of Micro and Nanoplastics

The activities, individual focus areas, and achievements of the five CUSP Projects [Aurora, Imptox, PlasticHeal, PlasticsFatE and POLYRISK] were presented by Vladimir Lobaskin, Associate Professor at the University College Dublin, and Anil Patri, Chair, Nanotechnology Task Force and Director of the Nanocore, National Center for Toxicological Research, US Food and Drug Administration, during the NanoWeek US-EU Characterization—Communities of Research (CoRs) session.

Complex phenomena, such as the global presence of MNPs in our environment, can only be dealt with effectively by uniting strengths and dealing with this issue on a large scale. Uniting five research initiatives in one large cluster engenders synergies and amplifies the efforts of individual research initiatives. The CUSP projects are also working closely with the European Commission’s Joint Research Centre to enhance the impact of their research and to make sure there is a constant dialogue between science and policymaking.

During the CoRs session, substantial interest was generated from both the physical and online audiences, and discussions focused on data FAIR-ness and the use of eNanoMapper and IPCHEM, among other aspects of these initiatives. CUSP representatives clarified that all data from the five projects would undergo thorough FAIR-ification. Moreover, results from the CUSP projects’ research and investigations are being made available on the individual project websites and on the [CUSP Zenodo Community](#).

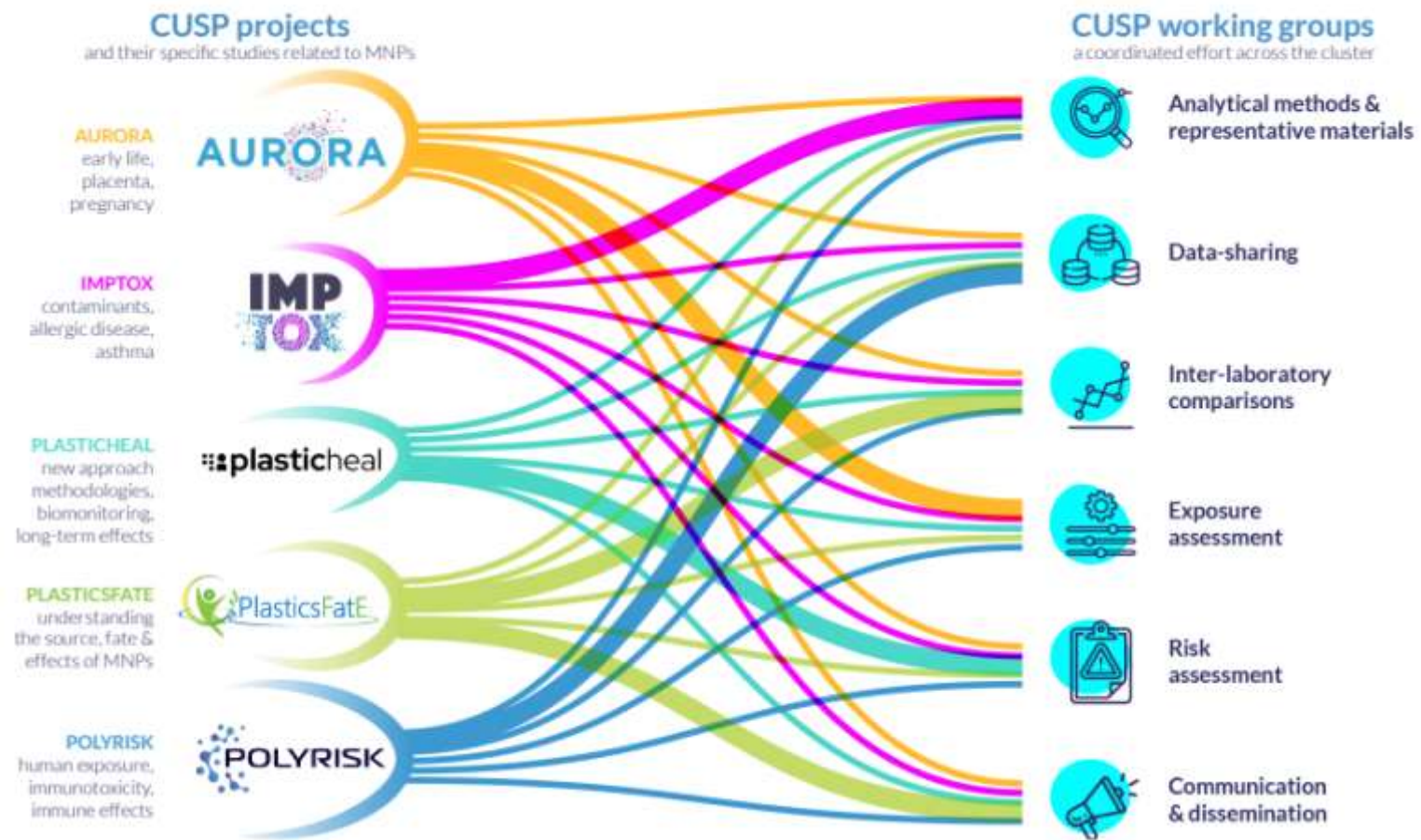


Image credit: Promoscience, Imptox



Cntd → CUSP @ NanoWeek

The CoRs MNP session summary was compiled and presented by Vladimir Lobaskin at the plenary, in which he outlined suggestions and proposals for further actions that emerged during discussions.

These include the following issues and areas:

- Learn lessons from nanosafety studies
- Minimum level of reporting for publications on MNP (including additives, adsorbing pollutants).
- Procurement of real-world samples (a repository?)
- Methods for robust reproducible characterization of pristine and aged MNP samples
- Quantitative methods for exposure to MNP
- SOPs / guidelines (e.g. California Water Board) for isolation, separation, characterization and quantitation and micro nanoplastics mixtures from complex matrices (water, sediments, food, feed, sea food etc).
- Comprehensive database (e.g. eNanoMapper)
- Inventory of projects and other resources (CUSP webpage)
- Representative Test Material (RTM) / Benchmark material/test material in the absence of 'reference material standards (e.g. Hawaii Pacific Univ. Polymer Kit)
- Models for release and adsorption of pollutants, morphology
- New challenges from 3D printers

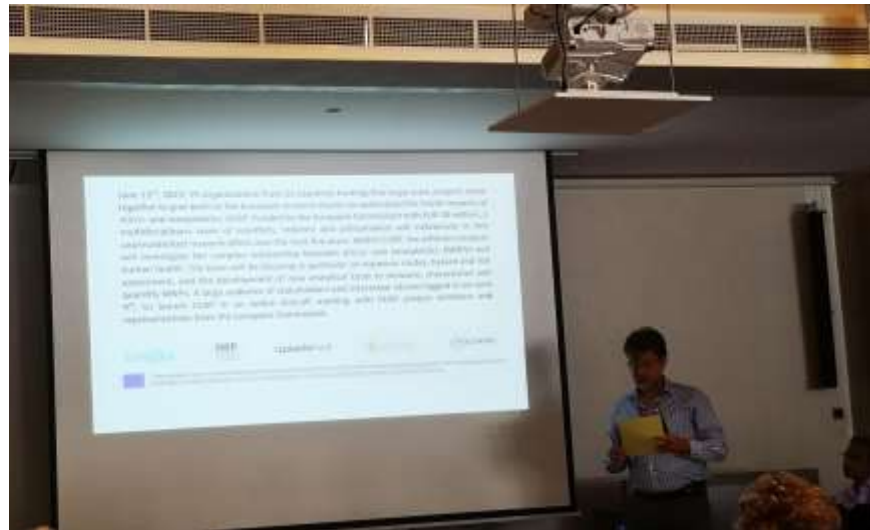


Image above: Vladimir Lobaskin presents CUSP in the CoRs MNP session

Image below: Lesley Tobin presents CUSP and PlasticsFatE at the evening poster session



[CUSP](#) is inviting all interested stakeholders to [sign up to our community](#), where you can be the first to learn about our results and to participate in the cluster's activities such as webinars, workshops, and conferences.

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.



For more information about CUSP:

- Visit the [CUSP website](#)
- Email us: [hello@cusp-research.eu](mailto:hello@cusp-research.eu)
- Download [the latest newsletter](#) and [subscribe to our next one](#)
- Follow us on [Twitter](#)
- Follow us on [LinkedIn](#)

Funding information

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreements AURORA No. 964827, IMP TOX No 965173, PLASTICHEAL No. 965196, PLASTICSFATE No 965367, POLYRISK No. 964766



The logo for PlasticsFatE, featuring a stylized green human figure with arms raised, surrounded by a circular arrangement of dots, symbolizing a global or interconnected network.

# PlasticsFatE @ NanoWeek

PlasticsFatE—one of the five CUSP Projects—took the opportunity offered by NanoWeek to present the project during the evening poster session, and through the distribution of its latest brochure.

## Poster Abstract

### Background, Motivation and Objective

The main goal of PlasticsFatE (Plastics Fate and Effects in the Human Body) is to improve our present understanding of the impact of micro- and nano-plastics (MP/NP) and associated additives/adsorbed contaminants (A/C) in the human body. Human exposure to MP/NP may result from the widespread use of plastic products and their release to the environment, where they degrade to MP/NP particles. But plastics particles reach human and natural systems also as secondary by-products, e.g., from tyre wear or abrasion of textiles. These particles are found in food, drinking water, air and environmental media (food chain, soils). Despite recent efforts to assess human risks associated with MP/NP, our current knowledge is still insufficient. One reason is the lack of reliable and validated methods able to generate the science-based data we need.

PlasticsFatE is addressing this challenge and associated uncertainties by implementing a comprehensive measurement and testing program ("test the test"), including inter-laboratory studies, to improve and validate the performance and applicability of available methods and tools to MP/NP. The tested and validated approaches will be used to (1) identify and detect MP/NP and A/C in a variety of complex matrices, such as food and beverages, human tissues, and consumer products as well as relevant environmental media (air, drinking water, soils), and to (2) assess their (also long-term) fate and toxicity in the human body by using advanced cell culture and organ models that simulate real exposure to MP/NP in the respiratory and gastro-intestinal tracts. PlasticsFatE is part of the newly built "European MNP cluster on human health" that will support various relevant European strategies for plastics, such as the European Strategy for Plastics in a Circular Economy.

### Statement of Contribution/Methods

PlasticsFatE is constructing a repository of materials for characterisation and testing, and the necessary protocols to do so. Materials include micro and nanoparticles of common plastics such as polystyrene, polyethylene, polyethylene terephthalate and polylactic acid, in primary and/or secondary form, and include fibres as well as spherical and irregular shaped particles. Moreover, a number of synthetic and natural fluids have been used to disperse the particles including Triton X 100, sodium surfactin, bile and serum.

The project's experimental approach involves the characterisation of selected MNPs; identification of the main exposure levels and sources; the development of novel in vitro co-culture cell models; the carrying out of human biomonitoring studies; and an investigation into the role of MNPs as vectors for bacterial colonisation.

Our approach is first to characterise the micro and nanoplastic particles (MNPs) using a number of standardised techniques and then to use these in different interlaboratory testing regimes to study interaction with and translocation across biological systems. At the same time we are studying and characterising different MNPs in matrices that are relevant to human health, including human tissues, food and drinks, air and water. This includes evaluating different analytical methods and digestion protocols to release MNPs from biological matrices. We are also studying the bacterial colonisation of different microplastics to understand effects on bacterial growth and physiology, and horizontal gene transfer (e.g. antibacterial resistance genes). Finally, PlasticsFatE is assessing worker exposure to MNPs in plastic packaging manufacturing and the uptake of different MNPs into the human food chain.

The data management plans will be stored in the central eNanoMapper database.

### Results/Discussion

Results and outcomes will be made available on the project website at [www.plasticsfate.eu](http://www.plasticsfate.eu); and on the CUSP Zenodo Community. PlasticsFatE is part of the EU CUSP MNP Cluster of projects.

# Plastics Fate and Effects in the Human Body

### PlasticsFatE in a nutshell

Human exposure to micro and nanoplastics (MNPs) may result from the widespread use of plastic products and their release into the environment, where they degrade to MNP particles. Our current knowledge of the associated human risks is still insufficient, partly due to the lack of reliable and validated methods able to generate the science-

Image above: Credit: PlasticsFatE partners, Ramsperger et al. 2022, submitted.

**PlasticsFatE** is improving our present understanding of the impact of MNPs and associated additives/adsorbed contaminants (A/C) in the human body by implementing a comprehensive measurement and testing programme ("test the test"), to improve and validate the performance and applicability of available methods and tools to MNPs.

These approaches will be used to:

1. identify and detect MNPs and A/C in a variety of complex matrices
2. assess their fate and toxicity in the human body by using advanced cell culture and organ models that simulate real exposure to MNPs

These will be integrated into a novel risk assessment strategy specifically designed for MNPs to provide the scientifically sound data needed to support the health-relevant aims of European policies and strategies for plastics.

### Experimental approach

- Selected MNPs are characterised by a number of analytical measurement and imaging techniques, such as DLS, ELS, FPIA, spICP/MS, TED-GC/MS, TEM, FTIR, Raman) and then applied to different in vitro and in vivo testing regimes to study their fate and effect in the human body.
- Main exposure levels and sources are identified in human-health related samples, including food, drinking water, air, human tissues, blood, faeces, urine, mucus, and personal care products. Performance of analytical methods and digestion protocols to release MNP particles and associated A/C from biological and environmental matrices will be validated by inter-laboratory comparison studies.
- Novel in vitro co-culture cell models are developed, including pulmonary (A549), intestinal (Caco-2) and immune (THP-1) cell lines, to understand mechanisms that may trigger short and long-term toxic and immune cellular responses to plastic particles and associated chemicals after inhalation or ingestion, and so help to reduce animal studies.

Image right: Microplastic particles in the human gut colonised by intestinal microbiota. Credit: CSIC 2022.

- Human biomonitoring studies will be carried out to assess exposure to MNPs at work places, including plastics packaging manufacturing, recycling, wastewater treatment and FFF 3D printing processes. Personal measurement equipment and specific exposure biomarkers are used, and histological and non-invasive samples (such as urine, EBC) taken, to study oxidative stress and inflammation resulting from uptake of MNPs in the human body.
- Role of MNPs as vectors for bacterial colonisation is investigated to understand effects on bacterial growth and physiology, as well as horizontal gene transfer of antibiotic resistance genes from infectious to environmentally friendly bacteria.

### Development of test materials

**PlasticsFatE** has built a repository of relevant plastic materials for characterisation and testing, and the necessary protocols to do so. Materials include micro and nanoparticles of common plastics including:

- Primary microparticles of PE (round), PET (fibres) and PLA (fibres)
- Secondary microparticles of PE and PET (irregular-shaped)
- Secondary nanoparticles of PE, PET and PP (irregular-shaped)
- Eu-doped PS nanoparticles (spherical)

Image right: Preparation of plastic particle dispersions in various test media (JL 2022) Credit: Photo by Valentina Perc

Natural and synthetic surfactants are being tested to disperse MNP particles in real matrices (e.g., water and human fluids), to mimic real-life exposure (inhalation, ingestion and translocation in blood) and testing conditions.

### Data management plans

Data generated within **PlasticsFatE** will be shared with others according to FAIR principles. We are working closely with other projects in the CUSP cluster (see below) to ensure harmonisation and standardisation of data recording.

All data will become transferred and stored in the central eNanoMapper database to inform a new prospective multi criteria decision support system (PMCDSS) being developed within.

### CUSP MNP Cluster

**PlasticsFatE** is part of the CUSP cluster of five H2020-funded projects researching specific aspects related to MNPs and human health, while collaborating on transversal themes in six common working groups.

Visit [www.cusp-research.eu](http://www.cusp-research.eu).

hello@plasticsfate.eu | @plasticsfate | www.plasticsfate.eu | https://bit.ly/PF\_L1

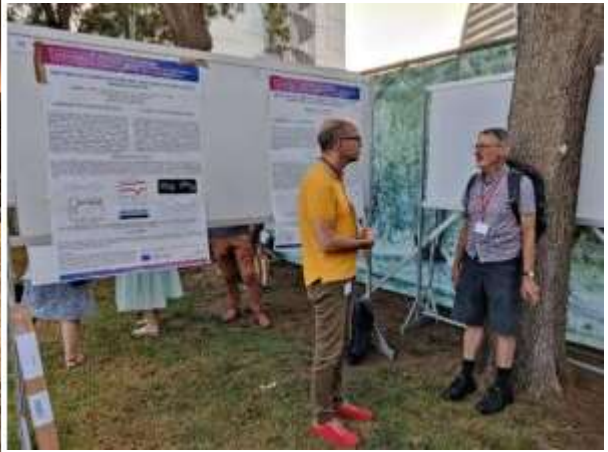
Get in touch and engage with us

PlasticsFatE has received funding from the European Union's Horizon 2020 Research and Innovation programme, under the Grant Agreement number 965367

## Funding information

PlasticsFatE has received funding from the European Union's Horizon 2020 Research and Innovation programme, under the Grant Agreement number 965367

Random snapshots of a wonderful week





## The NanoSafety Training School 2022



From 15–20 May 2022, around 120 scientists from the [European Nanosafety Cluster \(NSC\)](#), representing 15 projects, met in Venice to deliver the annual Nanosafety Training School – this year hosted as a hybrid event.

With around 70 participants gathering on-site and another 49 joining virtually, 22 interactive educational sessions were offered, covering a wide variety of current nanosafety research:

The overarching theme of the training school was: “Transition from Safe-by-Design to Safe-and-Sustainable-by-Design of advanced (nano)materials”, as we have now arrived at the point where the knowledge on genuine nanomaterials that has been developed within the nanoscience community over the past two decades is now permeating emerging research fields, including advanced materials, nanomedicine, microplastics, sustainable chemistry, and beyond.

In line with the theme, the questions: “What are they (nanoparticles)?”, “Where do they go?” and “What do they do?” were investigated from different perspectives, including the views of key stakeholders such as industry, regulators and society. These questions stem from the GRACIOUS framework for grouping of nanomaterials and include topics such as similarity assessment (grouping) and read-across approaches, but also extend to risk assessment and management, risk governance, and FAIR (Findable, Accessible, Interoperable, and Reusable) principles for data management and data quality assessment.



50 researchers from the EU and US nanosafety communities delivered interactive presentations during which speakers and participants engaged in lively discussions inside the beautiful and traditional Auditorium Santa Margherita of the Università Ca' Foscari Venezia. Participants described some of their highlights as “Getting different perspectives on nanosafety”; “Networking”; and “Meeting other young scientists”.

This year’s main organiser was the SUNSHINE project, together with partners from ASINA, CHARISMA, DIAGONAL, HARMLESS, NanoInformaTIX, SABYDOMA, SAbYNA and SbD<sub>4</sub>Nano. However, the school would not have been possible without further support and contributions from CEINT, Gov<sub>4</sub>Nano, NanoCommons, NANORIGO, NanoSolveIT, RISKGONE, and the EU NanoSafety Cluster.

### Contacts

The scientific and organising committees thank everyone for their support and hope to meet again for the next Nanosafety Training School on the islands of Venice in 2023.

- [Danail Hristozov](#), GreenDecision (IT)
- [Stefania Melandri](#), Warrant Hub (IT)
- [Paola Basso](#), GreenDecision (IT)
- [Cathrin Cailliau](#), Yordas Group (DE)

### More information, presentations and videos

A full list of the scientific and organising committees and further information about the School is available on the event page [here](#).

The full programme including all details on the presenters, trainers and the content of the session is available [here](#).

The presentation slides are linked under the titles of the full event programme [here](#).

The videos we recorded of the session will be available soon.



[Cntd →](#) [More news from the SUNSHINE Project](#)

## SUNSHINE E-Learning Section now Available

SUNSHINE now has a place to gather all the e-learning information from the project. Videos, documents, and everything related to SUNSHINE e-learning can be found here: <https://www.h2o2osunshine.eu/e-learning>



This section will also be updated with the session videos from the Nanosafety Training School 2022 once they are available (expected in July 2022).

## NanoTox 2024

The three NMBP-16 projects SUNSHINE, DIAGONAL and HARMLESS will organise the NanoTox 2024 together! Stay tuned for more information.

## Events and Publications

Please visit our [website](#) to view all the [events](#) our partners participate in. SUNSHINE partners contribute to the field of scientific research also with their publications. Please see all the SUNSHINE publications [here](#).

## Other News from the SUNSHINE Project

The SUNSHINE project has published its official project explainer video. Get a quick overview of the project [here on YouTube](#) in the video "SUNSHINE project explained – Safe and Sustainable by Design Nanomaterials".

## Follow us!

SUNSHINE on Twitter: [/h2o2osunshine](#)

SUNSHINE on LinkedIn: [/h2o2o-sunshine](#)

## Project Facts

Project Reference: 952924

Duration: 48 months, start in January 2021

## Contacts for Press

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

Cathrin Cailliau  
Dissemination Manager  
Yordas Group  
[c.cailliau@yordasgroup.com](mailto:c.cailliau@yordasgroup.com)

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## SbD<sub>4</sub>Nano Progress

SbD<sub>4</sub>Nano set out to develop a novel software infrastructure, an "e-infrastructure", to foster dialogue and collaboration between actors along the nanotechnology supply chain. Our project is currently making considerable progress in the case studies necessary to validate this e-infrastructure, and working towards enabling the reduction of hazard and exposure while satisfying functionality for intended uses in the market.



## Consortium Meeting

On May 24 and 25, 2022, the SbD<sub>4</sub>Nano consortium got together virtually to discuss the project's progress. We had a very fruitful exchange and an interactive version of the e-infrastructure could be presented. Stay tuned for the next updates on our work and the SbD<sub>4</sub>Nano e-Infrastructure.

## Forthcoming Events

SbD<sub>4</sub>Nano is taking part in various events in the field of safe-by-design research in nanotechnology and supply chains. Check out our events page [here](#) to know which events to look to find SbD<sub>4</sub>Nano partners!

## Follow us on social media

SbD<sub>4</sub>Nano on Twitter: [/SBD4Nano](#)

SbD<sub>4</sub>Nano on LinkedIn: [/safe-by-design-for-nano](#)

## Project Facts

Project Reference: 862195

Duration: 48 months, start in April 2020

Total Budget: 6M €

## Contacts for Press

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

Cathrin Cailliau  
Dissemination Manager  
Yordas Group  
[c.cailliau@yordasgroup.com](mailto:c.cailliau@yordasgroup.com)



## CHARISMA Reports

### CHARISMA Holds its First Biannual Consortium Meeting of 2022 in Toledo

The general assembly took place between 27-29 April 2022 in the beautiful Spanish city of Toledo in a hybrid format. Each work package leader contributed to the meeting with a presentation of the progress and results of their work packages, which aimed to provide a deeper insight into the roles and responsibilities that served CHARISMA's future goals.

[Want to learn more about the consortium meeting?](#)  
[Read our news article here.](#)



### Let's talk about CHARISMA!

CHARISMA Project invites you to get to know its partners better. We are interviewing our partners, asking about their roles and responsibilities within the scope of the project. They share their expert opinions about Raman spectroscopy and related technologies as well. Check out our interviews below, and stay tuned for more!

#### *Hot off the press!*

[Raquel Portela \(CSIC\) on Current Trends in Raman Spectroscopy and CHARISMA](#)

#### *Previous Interviews:*

[Aino Nielsen \(Topsoe\) on CHARISMA Project and Raman Harmonisation](#)

[Iván Moya Alcón \(UNE\) on The Importance of Standardisation Activities](#)

[An Interview with Dr. Enrique Lozano Diz from ELODIZ](#)

### Standardisation in research and innovation: the case of CHARISMA project

Iván Moya Alcón from the CHARISMA project partner UNE wrote on the link between standardisation and Research & Innovation projects with a special focus on CHARISMA.

[Read the full article here!](#)

### CHARISMA Poster, Brochure and Video

CHARISMA Project has a growing collection of project information materials that aim to give the nanotechnology, nanosafety and Raman spectroscopy audience a deeper insight into its objectives.

You can access the project materials [here](#). And remember to watch our project video, too!

[Click here to watch CHARISMA!](#)

#### Follow us on social media

CHARISMA on Twitter: [/h2020charisma](#)

CHARISMA on LinkedIn: [/h2020-charisma](#)

#### Project Facts

Reference: 952921

Duration: 48 months, start in November 2019

Total Budget: 5M €

#### Contacts for Press

Judith Friesl

Yordas Group

[j.friesl@yordasgroup.com](mailto:j.friesl@yordasgroup.com)

Yasemin Ertugrul

Yordas Group

[y.ertugrul@yordasgroup.com](mailto:y.ertugrul@yordasgroup.com)



## GRACIOUS

### Captain, I think we have GRACIOUS on the radar!

GRACIOUS is now listed on Innovation Radar – a European Commission initiative to identify high potential innovations and innovators in EU-funded research and innovation projects. The radar's goal is to allow every citizen, public official, professional and business person to discover the outputs of EU innovation funding and give them a chance to seek out innovators who could follow in the footsteps of companies such as Skype, TomTom, ARM Holdings, all of whom received EU funding in their early days. Innovation Radar will make information about EU-funded innovations from high-quality projects visible and accessible to the public via the Innovation Radar platform.

The partners involved are: ThinkWorks, Green Decisions, Yordas, LEITAT, European Research Services, Idea Consult, BASF, JRC und UKCEH.

Here you can see GRACIOUS on the radar:

<https://www.innoradar.eu/innovation/43074>

### Contacts for Press

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

Cathrin Cailliau  
Dissemination Manager  
Yordas Group  
[c.cailliau@yordasgroup.com](mailto:c.cailliau@yordasgroup.com)



### Project Facts

Project Reference: 760840

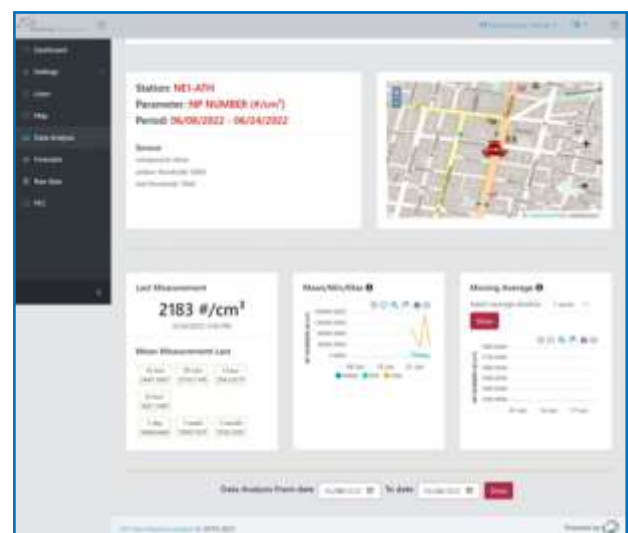
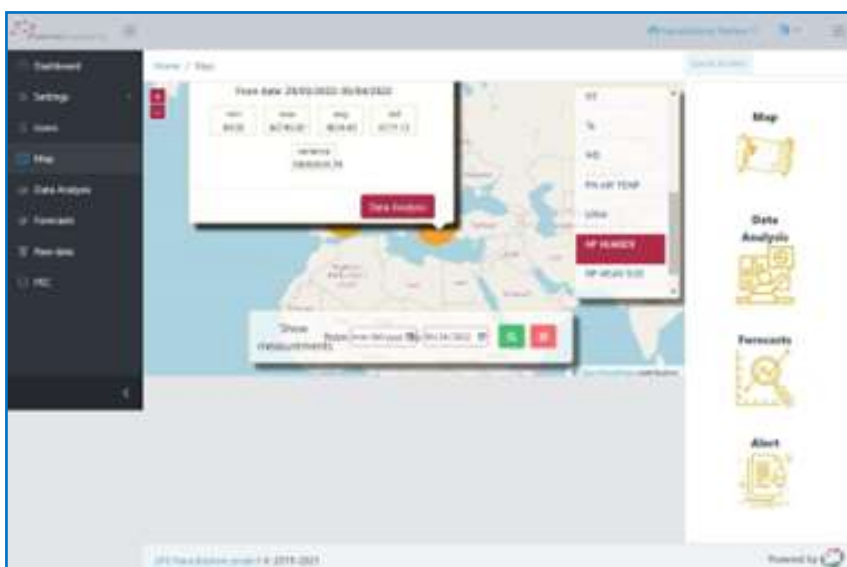
Duration: 48 months

Total Budget: 7.1M €

## NanoExplore Shares its Latest Output

### The NanoExplore Web-based Platform

NanoExplore's intelligent web-based platform aims at supporting the acquisition, management and processing of data on the concentration of engineered nanomaterials (ENMs) monitored by the sensor prototype network in industrial



Cntd →



## Cntd → [The NanoExplore Web-based Platform](#)

The platform was implemented to support input data originating from the NanoExplore sensors. It supports data from third-party sensors, enabling other environmental projects, researchers, stakeholders and others to contribute data that can or cannot be publicly available.

The platform provides both a publicly available interface as well as an administrative environment for registered users with advanced privileges and provides end users with rich tools for data visualisation and analysis, and access to raw data. Specifically, the different tools include Map, Real Time Dashboard, Detailed Data Presentation, Data Filtering and Export, Statistic Calculations, User Registration/Management, Sensor Monitoring and Alerting.

Try the NanoExplore Platform now: <https://nano-explore.getmap.gr/register>

## NanoExplore at NANOTECHNOLOGY 2022!

NanoExplore participated in Nanotechnology 2022 in Thessaloniki, Greece, with an exhibition as well as presentations, lectures, workshops and so forth! Participants had the chance to visit **our stand at NANOTECHNOLOGY Expo 2022 to test our device, the NanoExplorer!**

[NanoExplore](#) has developed an "Indoor/Outdoor Ultra-Fine Particle and PM sensor" for air quality monitoring and exposure prevention. Are you working with nanoparticles in your company or research institution?

[Click here and take a look at our device data sheet!](#)

NanoExplore invites you to participate in a brief survey about your experience with our web-based platform and the NanoExplorer device!

[Take a moment and take part in our survey here!](#)



A special conference session, aka "NanoExplore Conference", led by NanoExplore project took place as part of Nanotechnology as well. Our conference was about monitoring processes of engineered nanomaterials. The topics discussed as part of the conference can be found [here](#).

## NanoExplore Workshop III: Exposure and Health Effects monitoring of engineered nanomaterials (Nanotechnology ISSON22)

Pavla Dohanyosova ([Ramem/Arquimea](#)) and Ernesto Gonzalez ([ITENE](#)) represented NanoExplore in this year's summer school as lecturers. Dohanyosova and Gonzales spoke about "Exposure and Health Effects monitoring of engineered nanomaterials" within the scope of nanomedicine on July 9, 2022. Download the full program of the summer school [here](#).

## NanoExplore organised and successfully ran two workshops.

NanoExplore organised two workshops on very topical issues in the field of nanoengineered materials and health in the past months and met the nanosafety audience. The recordings of these workshops will be soon available to the wider public. If you would like to receive the recordings as soon as they are available for viewing, please subscribe to our newsletter [here](#) and follow us on our social media. Click on the workshop titles below to view the details!

- [NanoExplore Workshop I: Understanding biomonitoring protocols and biomarkers in environments with high exposure to nanomaterials \(May 25, 2022\)](#)
- [NanoExplore Workshop II: Lessons learned from workplace exposure campaigns \(June 29, 2022\)](#)

[View NanoExplore events here](#) to see where NanoExplore has been so far and will be in the future.

On 21 May 2022 the LIFE programme – the EU's funding instrument for the environment and climate action – turned 30. Congratulations from NanoExplore! Read more about the LIFE programme: <https://www.lifeis30.eu/>

## NanoExplore is on social media!

Follow NanoExplore on Twitter: [/LFnanoexplore](#)

Follow NanoExplore on LinkedIn: [/company/life-nanoexplore](#)

**Contacts:** [Judith Friesel](#) and [Cathrin Cailliau](#)





## SABYDOMA's Technology Transfer Activity

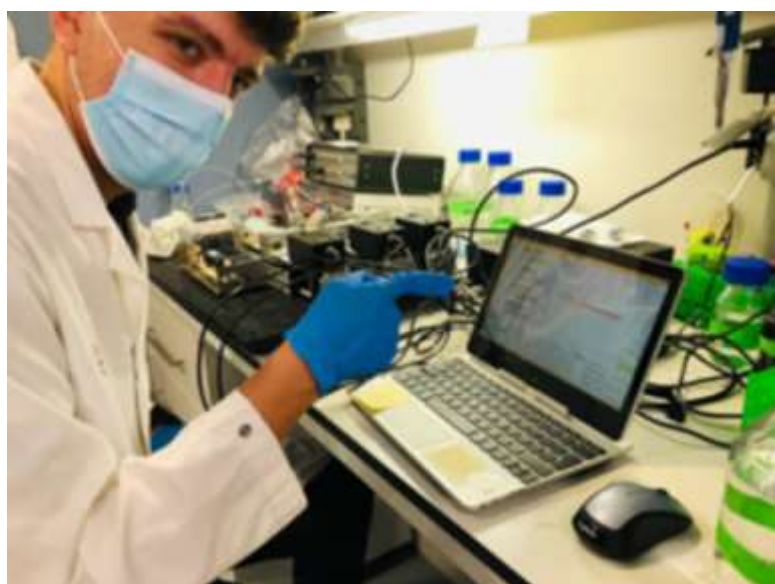


As the project advances and the technologies are being developed in the different organisations, the technology transfer between universities/RTOs and industrial partners starts.

From 17 – 20 May 2022, Will Stokes from **University of Leeds** (UNIVLEEDS) travelled to the facilities of **Applied Nanoparticles** (APPNPS) in Barcelona (Spain) for the commissioning of the Biomembrane Sensor, i.e., transfer the biomembrane sensing equipment, developed by UNIVLEEDS, to APPNPS as part of **Case Study 1**.

During this visit, Martí Busquets Fité (APPNPS) received training on various tasks required to operate the system, include the formation of a Mercury sensing element and lipid membrane required for performing cytotoxicity assays. Both partners, UNIVLEEDS and APPNPS verified that the duplicated equipment gave a similar response to the original system, by performing a sweep of assays on Silver Nanoparticles fabricated by APPNPS.

APPNPS will now demonstrate the use of the biomembrane sensing equipment in their industrial setting.



Above: Martí using the control software to form a lipid monolayer

Right: Martí preparing a mercury sensing element



### What is SABYDOMA about?

The first ideas for the project were developed originally to solve issues of environmental pollution and climate change. SABYDOMA is based on the technology developed in the [EU H2020 HISENTS project](#), which builds a high-throughput flow through platform for screening nanomaterials using multiple sensor elements; and, aims to develop a Lead Demonstrator which will be used for the flow-through production of safe nano .

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

**Contact:** [info@sabydoma.eu](mailto:info@sabydoma.eu)



## NanoPAT's Status Two Years On (May 2022)

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



The project has finished its second year and lots of advances have been made so far.

In January 2022, NanoPAT had its first Review Meeting where we showed our Project Officer, and our external expert the progress on the developments within the project, the achievements during the first reporting period, as well as our upcoming plans. They gave us great feedback that will guide us in the upcoming months.

During the last six months, NanoPAT has finalised the descriptions of the 5 Case Studies (the nanoparticles to be monitored are polymers, silica, hydroxyapatite, zeolite and ceramic) for the integration of the monitoring technologies and the CFD simulation.

The validation process at lab scale of the three monitoring technologies (BRAVE, PDWA, IRIS) has/is taking place in the three RTO pilots (UP, ZHAW and UVP) and the scale-up suggestions on where the different nanomaterial monitoring devices will be placed for the scale-up tests in the industrial pilot plants have been done.

Furthermore, relevant work is being performed between Analisis-DSC and the PAT technology providers for the integration of the three technologies and to prepare the future installation of the sensors/prototypes in the facilities of the end users (Fluidinova, Cnano, Evonik, Arkema, DSM) for the industrial pilot scale validation of the technologies. Once the pilot scale validation is successful and the end users prepare their pilot lines for hosting the prototypes, we will head into the industrial pilot plant demonstration of the technologies.

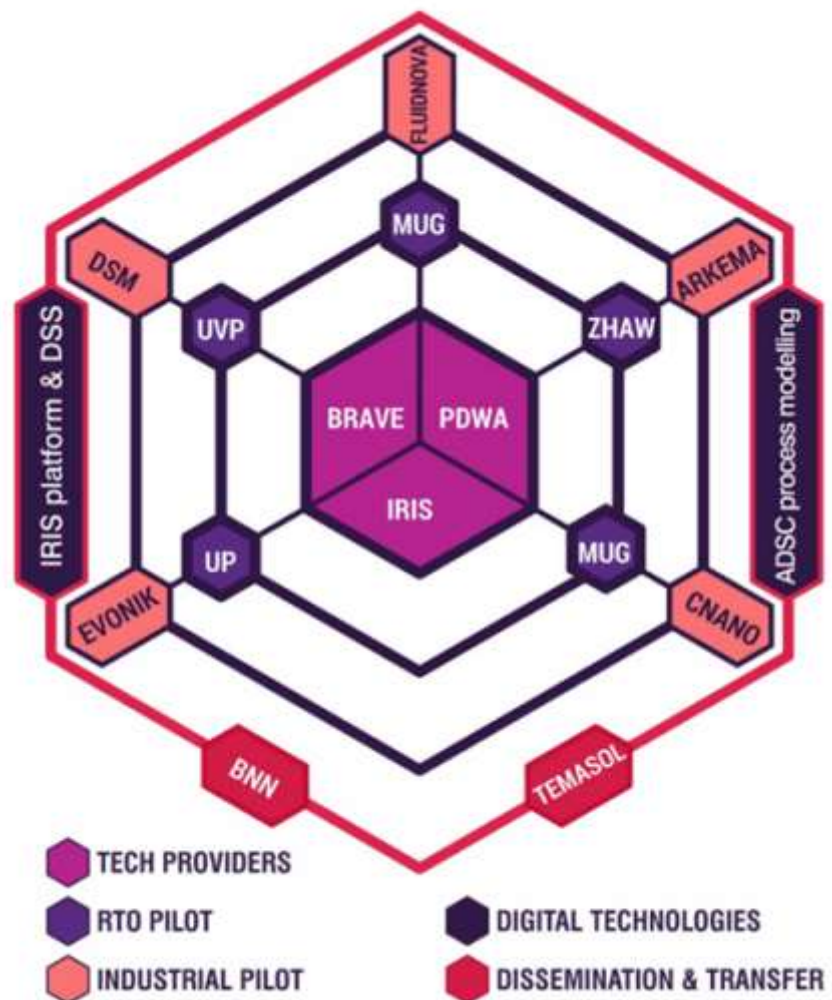
At the same time, a lot of activities are being organised by BNN and TEMASOL towards collaboration with other EU funded projects with similar or supplementary activity. Additionally, the project partners have been very active with the organisation and/or participation in conferences and other events to promote their research, as well as external and internal knowledge transfer activities for exchanging ideas internally and with professionals of the industry that are eager to integrate tools that can help us fulfil the common goal.

Over the next period, BNN is also involved in the organisation of very interesting events for the dissemination of our results. NanoPAT will be very active in workshops and events in the upcoming months, so stay tuned for more information on this aspect.

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

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

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



Overview of the roles of NanoPAT partners



## Implementation of PDW technology at the industrial NanoPAT partners



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

NanoPAT was very active during spring this year as the work on the implementation of the [PDW technology](#) at the industrial NanoPAT partners is ongoing.

The first activity took place on May 11th, when the [UP/innoFSPEC team](#) visited the industrial site of NanoPAT partner [Evonik](#) in Wesseling (Germany), within the framework of the [Case Study 2](#) of the project, real-time in-situ monitoring of the genesis of nanostructured silica under different precipitation conditions.

On May 24th, the UP/innoFSPEC team visited the facilities of [Covestro](#) in Waalwijk (Netherlands), within the framework of [Case Study 1](#) of the project, [monitoring particle formation of polyurethane dispersions and polyacrylate emulsions](#).

During their visits, the UP/innoFSPEC team visited Evonik's and Covestro's R&D labs as well as their pilot and production plants and together with the industrial partners' colleagues they planned the technical implementation of PDW technology at Evonik's & Covestro's labs to explore the full potential of PDW spectroscopy as a potential new PAT in the production process of silica and polymers.

### Project Summary

Nano-scaled materials are abundant in different stages of industrial manufacturing. Physical and chemical properties of these materials are strongly dependent on their size. Characterisation of mean size, size distribution, and shape of nano-scaled particles is very critical for the quality and efficiency of manufacturing processes. Yet, conventional characterisation technologies still show manifold shortcomings which represent a major innovation obstacle for manufacturers of nanoparticles.

The NanoPAT consortium aims at closing this gap by the demonstration of 3 novel, real-time nano-characterisation [Process Analytical Technologies \(PAT\)](#), namely [Photon Density Wave spectroscopy \(PDW\)](#), [OptoFluidic force induction \(OF2i\)](#) and [Turbidity Spectrometry \(TUS\)](#) including real-time data handling

*Images:*  
UP/innoFSPEC team at Evonik (top) and Covestro (bottom)



## HARMLESS Project Video



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

HARMLESS is pleased to introduce a [project overview video](#) presenting the main concepts and ideas behind the project.

Advanced materials with improved properties are being developed which should be safe for ecosystems and humans and protect our natural resources. These advanced materials are often complex mixtures of multiple components for which routine approaches towards clarifying their safety are of limited use. HARMLESS provides new and integrated tools, which assess the safety of advanced materials during their entire life cycle.

One particular challenge to safety assessment is the use of nanostructures and matrix-embedded small particles, which are becoming more widely used in various products such as paints. When paints are exposed to harsh weather, they degrade over time and small particles, potentially including sizes of less than 100nm, or 100 times smaller than a strand of hair, can be released into the air, soil or water. Similarly, small particles can be released from certain plant protection products when bags are transferred, or when the product is sprayed onto fields.

In both cases, the release of small particles can be harmful to human health, particularly when particles are inhaled, and to the environment, especially since small particles often react stronger and may be transported differently throughout air, soil, water and organisms than large particles. HARMLESS provides new and integrated tools for safety assessment of products containing advanced materials throughout their entire lifetime.

This Safe-by-Design approach refines the components of newly developed products with respect to shape, composition and many other parameters, during the various stages of product development until an adequate balance of safety and functionality is reached. HARMLESS supports industry in making the right decisions on the most sustainable and harmless materials to choose for making functional and safe consumer products for a wide range of different sectors from construction, to catalysis, manufacturing, and agriculture.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 953183.



# SweNanoSafe

Swedish National Platform for Nanosafety

## SweNanoSafe Issues Report: Nanosafety, the Sustainable Development Goals and meeting EU policy ambitions

SweNanoSafe - the Swedish national platform for nanosafety is a forum for collaboration on nanosafety issues hosted by the Institute of Environmental Medicine, Karolinska Institutet. SweNanoSafe aims to be a bridge between academia, authorities, industry and other organizations that have an interest in sharing knowledge and experiences as well as discussing, developing and influencing the implementation of nanosafety in society. Our goal is the safe handling of nanomaterials at all levels so as to protect human health and the environment. To this end, we have a strategic role in providing support to national authorities in matters concerning nanosafety. Important themes during 2022 are circularity and sustainable development.

See our latest report on *Nanosafety, the Sustainable Development Goals and meeting EU policy ambitions*. SweNanoSafe coordinates a national research network and education network. You can read more about SweNanoSafe here.

The SweNanoSafe focus areas include sustainable development of nanotechnology and this report aims to describe the alignment between the UN Sustainable Development Goals (SDGs) and the SweNanoSafe objective and activities. In addition, the report includes reference to how the SweNanoSafe activities contribute to the new European Union (EU) policy ambitions, including the EU Green Deal and Chemicals Strategy for Sustainability.

Download the SweNanoSafe Report 2022:02.

The report initially provides an overview of the expected key-enabling opportunities that nanotechnology provides for sustainable development, while at the same time challenging the current health risk assessment frameworks and legislations, which are not agile enough to handle the vast number of complex nanomaterials considered in technological innovation.

An overview of the status of sustainable development in Sweden is also provided followed by a short description of the concept of nanosafety and the six overarching SweNanoSafe activities. The main part of the report details the synergies between 12 of the 17 SDGs and the SweNanoSafe objective, providing examples of stakeholder-engaging activities where relevant.

The report was drafted by Marietta Athanasiou and Penny Nymark (SweNanoSafe/KI) and reviewed by Lya Soeteman-Hernandez (Lead expert of the OECD Steering Group for Safe Innovation Approach and Senior risk assessor at the Dutch National Institute for Public Health and the Environment), and Urban Boije af Gennäs, Stefan Gabring and Gregory Moore at the Swedish Chemicals Agency (KemI).

**Anda GLIGA**, PhD Assistant professor  
Unit of Metals and Health & SweNanoSafe  
Institute of Environmental Medicine | Karolinska Institutet  
Nobels väg 13 | Box 210 | SE-171 77 Stockholm  
[anda.gliga@ki.se](mailto:anda.gliga@ki.se) | [ki.se](http://ki.se)



## IRISS—Major EU initiative launched to accelerate the transition to safe and sustainable materials, products and processes

To ensure that materials are sustainable for humans and the environment, to increase recycling and use resources in a more efficient way, efforts are required from an early stage of design and manufacturing. Thus, the EC has launched a major initiative, IRISS, which will accelerate the transition to safe and sustainably designed materials, products and processes. The consortium, led by IVL, will create a global network of experts and stakeholders. Six value chains represented in the project will provide a clear picture of the industry's ongoing and future transformation.

"The chemical industry and all value chains that manufacture materials and products are facing major transformations to create safe, circular flows. To achieve this, optimised processes and products based on sustainable raw materials that are safe for humans and the environment are needed," says Emma Strömberg, researcher and project coordinator at IVL Swedish Environmental Research Institute.

The EU is investing more than €3.5 million in the IRISS project, which will build a network of stakeholders, including companies, researchers, authorities, and other societal actors, to support this transition. Fundamental to the whole effort is the concept of Safe-and-Sustainable-by-Design, SSbD, which includes focusing early in the supply chain on providing products that are part of circular models while avoiding properties that may be harmful to human health or the environment. It integrates circularity, climate neutrality, functionality and safety of materials, products and processes throughout the life cycle.

"These are four important building blocks that must all be included when designing new materials and products. By taking action and making improvements already at the design stage, we can reduce resource consumption and climate emissions and at the same time design products and materials that can be more easily circulated and recycled. This is a prerequisite for us to achieve the goals that have been set in the EU Chemicals Strategy for Sustainability and the UN's Sustainable Development Goals," says Emma Strömberg.

IRISS, which stands for *The International ecosystem for accelerating the transition to Safe-and-Sustainable-by-design materials, products and processes*, will support companies, both with knowledge and through the implementation of research, and contribute to guiding principles for the development of life cycle thinking in material and product design. In collaboration with industry, a number of roadmaps will be developed to implement research and innovation, but also to demonstrate needs that exist in the policy area. Six value chains are in the focus of the work: textiles, construction, electronics, energy, automotive and packaging.

"The implementation of the SSbD concept is an important area where we will support the industry to meet the challenges that exist and achieve set goals," says John Munthe, Director of Research at IVL. "In addition to the fact that the EU Chemicals Strategy for Sustainability includes the implementation of SSbD, there is pressure on the development of future materials and products that will meet the goals of EU Green Deal for the transition to climate neutrality and sustainability. We hope that IRISS will contribute with an important piece of the puzzle."

The consortium consists of European research institutes, trade associations, companies, authorities and universities, as well as National Technology Platforms within SusChem. Swedish partners are IVL Swedish Environmental Research Institute, which is the coordinator, the Innovation and Chemical Industries in Sweden, IKEM, and the SusChem Sweden platform.

### For more information, please contact:

Emma Strömberg, [emma.stromberg@ivl.se](mailto:emma.stromberg@ivl.se); John Munthe, [john.munthe@ivl.se](mailto:john.munthe@ivl.se)

### Facts:

IRISS, *The international ecosystem for accelerating the transition to Safe-and-Sustainable-by-design materials, products and processes*, is a three-year project, start date 1<sup>st</sup> of June 2022, funded by the EU's framework programme for research and innovation, Horizon Europe. It has a budget of €4.3 million, of which approximately €3.5 million come from the EU, as well as additional funding through the University of Birmingham and Swiss Federal Laboratories for Materials Science and Technology.

### The consortium consists of 20 partners:

IVL Swedish Environmental Research Institute; Leuphana University of Lueneburg; BNN, BioNanoNet Forschungsgesellschaft mbH; RIVM, National Institute for Public Health and the Environment; University of Birmingham; Fundación Tekniker; Cefic, European Chemical Industry Council; EMPA, Swiss Federal Laboratories for Materials Science and Technology; ETP, EU Technology Platform for the Future of Textiles & Clothing; CLEPA, European Association of Automotive Suppliers; EMIRI, Energy Materials Industrial Research Initiative; EFCC, European Federation for Construction Chemicals; INL, International Iberian Nanotechnology Laboratory; IPC, Industrial Technical Centre for Plastics and Composites; KI, Kemijski Institut; VTT, Teknologiska Forskningscentralen; IKEM, Innovation and Chemical Industries in Sweden; APRE, Agencia Per la promozione della Ricerca Europea; Czech Technology Platform for Sustainable Chemistry; National Technical University of Athens

*The project receives funding from the European Union's HORIZON EUROPE research and innovation programme under grant agreement n° 101058245*



## Introducing the Cefic-LRI Microplastics Cluster

We are delighted to introduce to you a cluster of four projects that are researching plastics in the environment, funded by the **European Chemical Industry Council's Long-Range Research Initiative (Cefic-LRI)**. The projects started last September and will run for 2 years. They are collectively aiming to advance our understanding of how plastics move around and transform within the whole environment.

### UTOPIA: Development of a multimedia unit-world open-source model for microplastic

This project aims to develop an open-source, multimedia unit-world model of plastic fate and exposure, covering terrestrial, water, sediment and atmospheric compartments. The model will provide a platform for screening level risk assessment and the calculation of exposure indicators, as well as helping us identify key knowledge gaps and drivers of uncertainty. Lead: Matthew MacLeod, Stockholm University. [View poster.](#)

### μPLANET: microPlastic Long-range transport Assessment and Estimation Tools

The goal of μPLANET is to advance our understanding of the long-range transport of plastics through the development of a long-range transport model, integrating knowledge and models on terrestrial riverine mobility, coastal processes and atmospheric transport. Key outputs will be microplastic long-range environmental transport (LRET) metrics. Lead: Antonia Praetorius, University of Amsterdam. [View poster.](#)

### Comprehensive additive release and bioaccessibility model for risk assessment of micro and nanoplastics in the environment

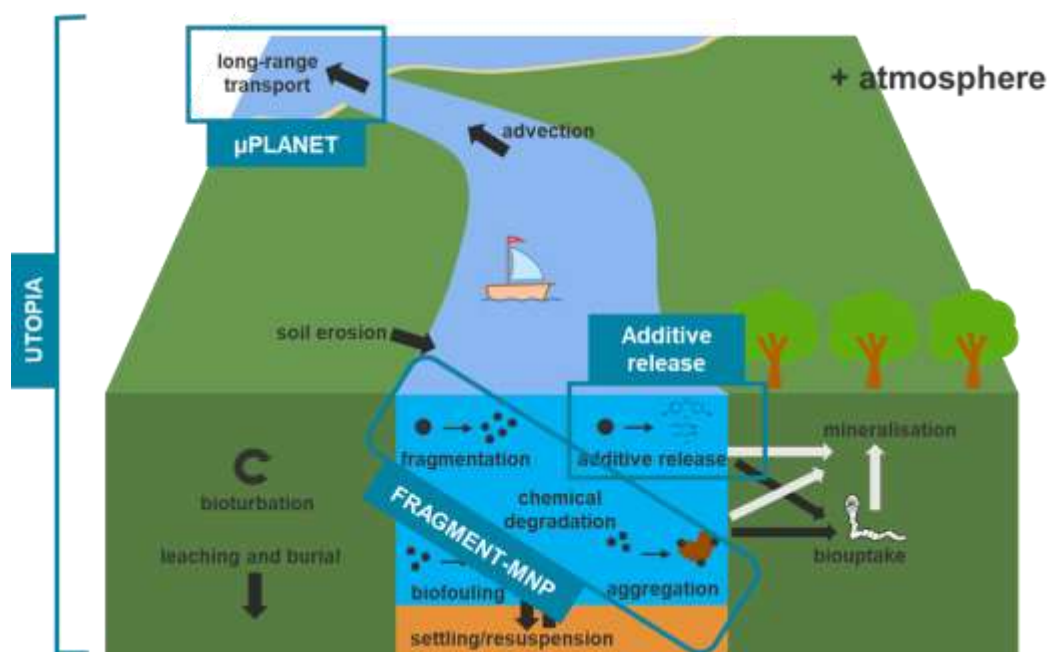
The release of additives from polymers raises concerns about potentially adverse effects from these additives. This project will develop a robust and generisable model to predict polymer additive release, transformation and bioaccessibility in realistic aquatic environments. Lead: P. Lee Ferguson, Duke University. [View poster.](#)

### FRAGMENT-MNP: Developing a mechanistic model of Micro and NanoPlastics FRAGMENTation in the ENvironment

The fragmentation of macro and microplastics towards the nano-sized particles is an important but poorly understood process. Nanoplastics are of particular concern due to their potential to permeate biological membranes. In this project, a mechanistic, open-source model of plastic degradation and fragmentation will be developed, underpinned by an experimental database of how degradation (e.g. from UV exposure, hydrolysis and biodegradation) affects fragmentation rates. Lead: Sam Harrison, UK Centre for Ecology & Hydrology. [View poster.](#)

Our projects are working closely together to share insights and knowledge, and ensure key model components are interoperable. For example, that changes in polymer properties due to additive release are reflected in fragmentation predictions, and that these fragmentation predictions can be used in the unit world and long-range transport models to account for the different fate pathways followed by different-sized plastic particles.

If you have any questions about our projects, are interested in using or learning more about our models, or have data that might be useful, then please do not hesitate to get in touch!



How our projects relate to the transport of microplastics around the environment

### Researchers involved:

Sam Harrison, Richard Cross, Gbotemi Adediran, Claus Svendsen - UK Centre for Ecology & Hydrology  
Wendel Wohlleben, Katherine Santizo, Patrizia Pfohl - BASF SE

P. Lee Ferguson, Mark Wiesner, Joana Sipe, Anna Lewis, Brandon Lewis, Ethan Hicks - Duke University

Matthew MacLeod, Prado Domercq - Stockholm University

Antonia Praetorius, Marianne Seijo - University of Amsterdam

Mick Whelan - University of Leicester

Todd Gouin - TG Environmental Research



## Nanomaterials—Contribute to the Special Issue

A Special Issue is being prepared for *Nanomaterials*, titled “Towards a Safe Nanotechnology: Understanding and Controlling Immunomodulatory and Toxicological Properties of Nanomaterials”

Since many of you are working on some aspects of safe nano, please consider this special issue for submitting your paper.

See below and on the dedicated website for more information

[https://www.mdpi.com/journal/nanomaterials/special\\_issues/MA4BN2W8H5](https://www.mdpi.com/journal/nanomaterials/special_issues/MA4BN2W8H5)

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**Towards a Safe Nanotechnology: Understanding and Controlling Immunomodulatory and Toxicological Properties of Nanomaterials**

Guest Editor:

**Dr. Felice C. Simeone**  
National Research Council (Italy)-  
CNR, Institute of Science and  
Technology for Ceramics - ISTEC,  
Via Granarolo (A), I-48012 Faenza,  
RA, Italy  
felice.simeone@isec.cnr.it

Message from the Guest Editor

Human and environmental exposure to nanomaterials has become an unavoidable reality. The expansion of nanotechnology has brought products of daily application to the market which use nanoparticles as functional or supporting materials. Understanding the interactions of nanomaterials with biological systems is crucial to anticipate biological risks and to establish criteria for designing as-safe-as-possible nanomaterials.

As often in science, improved knowledge around nano-safety has opened new questions arising from still unresolved uncertainties: the physicochemical heterogeneity of nanoparticles does not allow to generalize conclusions and the details of the interaction of nanomaterials with cells and organisms are largely unknown. As of today, these uncertainties still prevent the adoption of effective regulatory and protective rules. This Special Issue aims to collate articles focusing on new findings in nanotoxicology, methods for understanding the interaction of nanoparticles with biological systems, statistical methods to estimate risks, and strategies for mitigating risks of hazardous nanoparticles.

We look forward to receiving your contributions.

Deadline for manuscript  
SUBMISSIONS:  
**28 February 2023**

10.3390/nano131201

Special Issue

## Publication of the 100th ISO standard The 100th ISO standard under the direct responsibility of ISO/TC 229 has been published

Seyed Ali Johari  
[sajohari@gmail.com](mailto:sajohari@gmail.com)  
University of Kurdistan

The ISO/TS 4988:2022 entitled "Nanotechnologies — Toxicity assessment and bioassimilation of manufactured nano-objects in suspension using the unicellular organism *Tetrahymena* sp." has been published and is accessible via <https://www.iso.org/standard/80595.html>

The development of this standard started 5 years ago under the joint responsibility of Dr. Damjana Drobne from Slovenia and Dr. Seyed Ali Johari from Iran as project leaders, and after holding several meetings and obtaining the opinions of experts and scientists from several countries (i.e. USA, South Korea, Philippines, China, South Africa, and European Commission) it was finalized.

This document provides a reliable and repeatable method for simultaneous assessment of both exposure and toxicity of manufactured nano-objects (MNOs) using *Tetrahymena* sp. The ingested, internalized material (MNOs) indicates aquatic exposure. This document is intended to be used by all the centers working with nano(eco)toxicity of MNOs and capable of culturing of *Tetrahymena* sp. The method uses *Tetrahymena* sp. to assess exposure and effects of MNOs. In addition, the test can be used by centers (laboratories) interested in investigating the biological interaction of MNOs with living cells. This method is applicable to nano-objects such as nanoparticles, nanofibres of a certain size (in a  $\mu\text{m}$  size range), nanoplates, as well as their aggregates and agglomerates.

### Links:

<https://www.iso.org/committee/381983.html>

<https://www.iso.org/standard/80595.html>

<https://research.uok.ac.ir/%7Eajohari/en/>

<https://www.bionanoteam.com/members/damjana-drobne/>





## INISS-Nano: revised concept and action plan (International Network Initiative on Safe and Sustainable Nanotechnologies)

Andreas Falk; Pogany, Alexander; Aungkavattana, Pavadee; Bañares, Miguel A.; Beitollahi, Ali; Bim, Vinicius; Briffa, Sophie; Bochon, Anthony; Cassee, Flemming; Doridot, Fernand; Exner, Thomas; Farias, Patricia M.A.; Favre, Georges; Franzese, Giancarlo; Friedrichs, Steffi; Hristozov, Danail; Hunt, Neil; Indaraprasirt, Ramjitti; Karim, Md. E.; Khandelwal, Neha; Malsch, Ineke; Marcoulaki, Effie; Marjovi, Ali; Rasmussen, Kirsten; Rocca, Cris; Singh, Pushplata Prasad; Thongkam, Waluree; Tsuruoka, Shuji; Wilkens, Terence A.

Leeds University in collaboration with counterparts across the nanosafety community presents the following publication by leading international experts in this critical initiative on "Safe and Sustainable Nanotechnologies". Its foundations are based on the research from 21 highly successful EU nano - EHS projects. Andreas Falk and Alexander Pogany are credited for their leadership in bringing the expertise from so many disciplines to enable users to create products and processes of immense economic and societal benefits.



The "International Network Initiative on Safe and Sustainable nanotechnology" (INISS-nano) focuses on the **collaboration in different fields pertaining to nanotechnology research in general and nano-safety research in particular**. This includes collaboration in terms of e.g., training, standardisation efforts, test-guidelines development, metrology, commercialisation, ethical aspects, responsible science and research, sustainability, and joint research, supporting governance, regulatory guidance, and of course being open for further joint working items.

This document is a revision of the first version (published in June 2021) and shows descriptions and an **action plan** for each of the pillars:

- Harmonization
- Support industrial understanding
- Sharing / facilitate sharing of resources / infrastructures
- International collaboration on ethical and societal aspects of nanotechnology

[DOI:10.5281/zenodo.6818049](https://doi.org/10.5281/zenodo.6818049)

July 14, 2022

Working paper - Open Access

INISS-Nano: revised concept and action plan (International Network Initiative on Safe and Sustainable Nanotechnologies)



## European Registry of Materials: global, unique identifiers for (undisclosed) nanomaterials

[Jeaphianne van Rijn](#)

Maastricht University  
SbD4Nano

To make nanosafety research easier to reuse, it needs to comply with a number of requirements. The FAIR (findability, accessibility, interoperability, and reusability) principles address many important aspects, including the need to assign a globally unique and persistent identifier (F1).

Within the nanosafety community, the need was recognized for a persistent, unique identifier for nanomaterials. This to ensure that internal project documentation can later be linked to publicly released data and knowledge for the specific nanomaterials, or even to specific batches and variants of nanomaterials utilised in that project. A practical need from the nanosafety projects is that the identifier can be used without disclosing sensitive or embargoed information, but did allow linking of knowledge in a clearly defined way. Existing identifiers may not always be applicable, or sufficient to identify the specific nanomaterials utilised in a particular study, e.g. of batch differences. Therefore, several EU NanoSafety Cluster projects decided to create their own, modelled on similar efforts in the pharmaceutical industry. This gave rise to the European Registry of Materials (ERM) Identifier.

The recent ERM paper describes the background to this new identifier; how it complements other identifiers such as CAS numbers and the ongoing efforts to extend the InChI identifier to cover nanomaterials; and provide examples of its use in various H2020-funded nanosafety projects.

If this sparks your interest, please have a look at the paper here: <https://jcheminf.biomedcentral.com/articles/10.1186/s13321-022-00614-7>

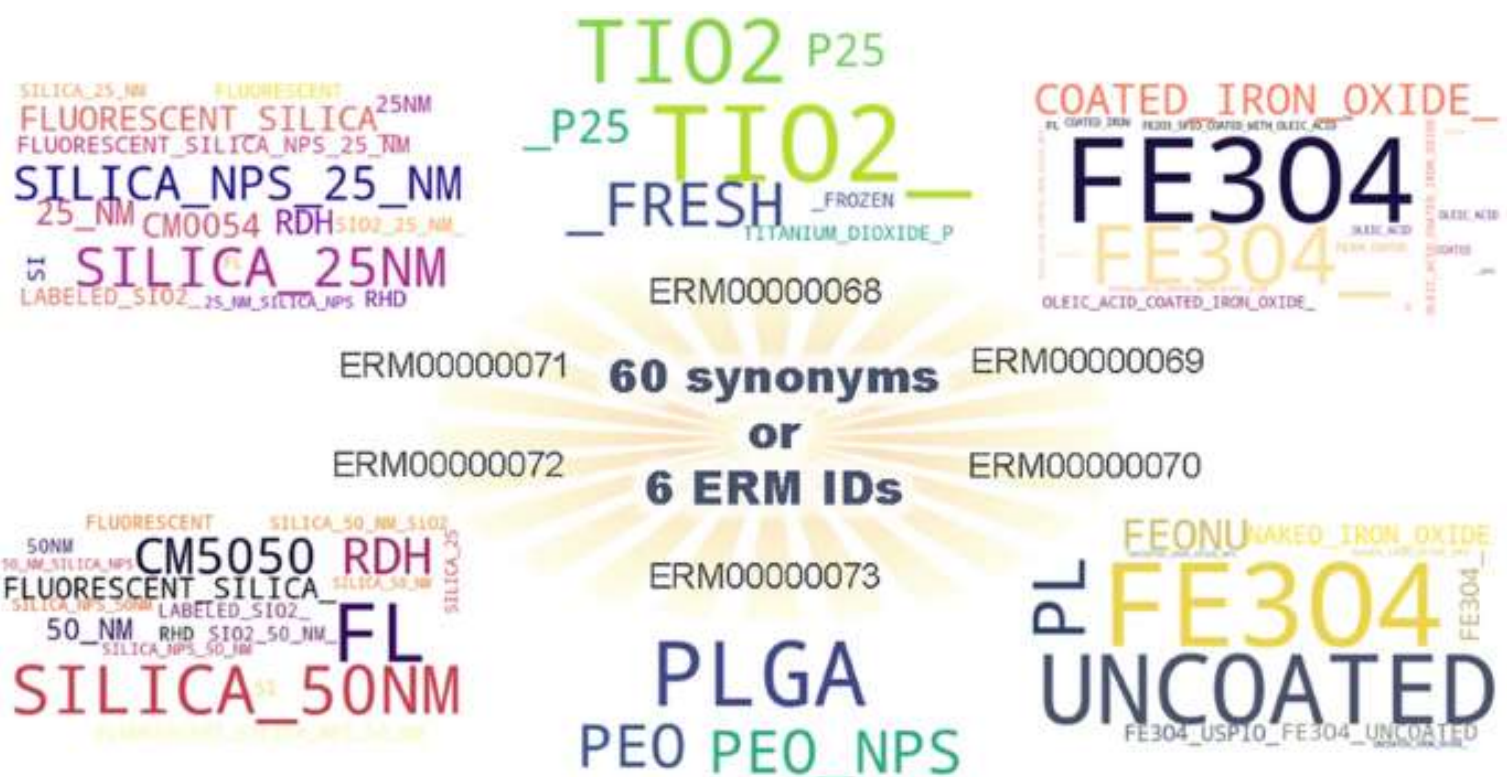


Image: The power of the ERM identifier: 6 ERM identifiers or almost 60 synonyms.

Image credit: <https://doi.org/10.1186/s13321-022-00614-7>.

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## SbD<sub>4</sub>Nano—New Publication on Sunscreen

The summer sun is becoming powerful these days. Have you considered that sunscreens are questioned due to the proven or believed ecotoxicity of organic ultraviolet (UV) filters? This has pushed developers increasingly towards the use of inorganic filters, which however prove difficult to spread with low compliance.



In our fresh publication "Criticisms in the Development of High Protection and Broad Spectrum 'Natural/Organic' Certifiable Sunscreen", the authors faced the problem by proposing a rational approach based on the evaluation of the morphology of the inorganic material – indeed, the real dimension often does not correspond to the characteristic declared by the producers because the material itself tends to aggregate.

A combination of a specially selected inorganic filter is required to formulate following Cosmetic Products having Connotation Natural and Sustainable (CPCNS) standards.

Authors: Guido Tortini, Paola Ziosi, Elena Cesa, Sonia Molesini, Erika Baldini, Daniela De Lucia, Elisa Durini, Caterina Rossi, Silvia Vertuani, Stefano Manfredini

Read the full article here: [doi.org/10.3390/cosmetics9030056](https://doi.org/10.3390/cosmetics9030056)

## CHARISMA partners publish their novel research in prestigious journals.



CHARISMA partners have been actively contributing to the published research in the field of Raman spectroscopy.

- Read "Review of Existing Standards, Guides, and Practices for Raman Spectroscopy" [here](#).
- Read "Chemometrics for Raman Spectroscopy Harmonization" [here](#).
- An extended abstract in English is now available on our project website for the CHARISMA publication "Monitoring of the antimicrobial of food packaging by Raman spectroscopy" which was originally written in Spanish and published in RevistaPlásticosModernos's January 2022 issue. [Click here to read now!](#)

For all CHARISMA publications, [click here](#) and visit our [Publications page!](#)

## Two brand-new GRACIOUS publications



Even as the project is officially over, the ideas generated in GRACIOUS are being published. The first one is "Integrated approaches to testing and assessment for grouping nanomaterials following dermal exposure", published in Nanotoxicology on June 15, 2022.

Authors: Luisana Di Cristo, Gemma Janer, Susan Dekkers, Matthew Boyles, Anna Giusti, Johannes Keller, Wendel Wohlleben, Hedwig Braakhuis, Lan Ma-Hock, Agnes G. Oomen, Andrea Haase, Vicki Stone, Fiona Murphy, Helinor Jane Johnston, and Stefania Sabella.

Access the full publication [here](#) and in the [repository](#) of Heriot Watt University.

The second publication, "How to formulate hypotheses and IATA to support grouping and read-across of nanoforms", was published in ALTEX on June 22, 2022.

Authors: Fiona Murphy, Helinor J. Johnston, Susan Dekkers, Eric A. J. Bleeker, Agnes G. Oomen, Teresa F. Fernandes, Kirsten Rasmussen, Paula Jantunen, Hubert Rauscher, Neil Hunt, Luisana di Cristo, Hedwig M. Braakhuis, Andrea Haase, Danail Hristozov, Wendel Wohlleben, Stefania Sabella, and Vicki Stone.

Access the full publication [here](#).



## NanoInformaTIX

Development and Implementation of a Sustainable Modelling Platform for NanoInformatics

### Recent Publications

The NanoInformaTIX partners would like to draw your attention to their recent publications, also accessible through links on the website: <https://www.nanoinformatix.eu/publications/>

-Nanomaterials 2022: "[A Multi-Scale Modelling of Aggregation of TiO<sub>2</sub> Nanoparticle Suspensions in Water](#)"  
15/12/ 2022

AUTHORS: Giulia Mancardi, Matteo Alberghini, Neus Aguilera-Porta, Monica Calatayud, Pietro Asinari, Eliodoro Chiavazzo

-SSRN: "[Predicting Electrophoretic Mobility of Tio<sub>2</sub>, Zno and Ceo<sub>2</sub> Nanoparticles in Natural Waters: The Importance of Environment Descriptors in Nanoinformatics Models](#)"

07/04/ 2022

AUTHORS: Marta Swirog, Alicja Mikołajczyk, Karolina Jagiello, Jaak Jänes, Kaido Tamm, Tomasz Puzyn

-Environmental Toxicology and Chemistry: "[Meta-analysis of Bioaccumulation Data for Nondissolvable Engineered Nanomaterials in Freshwater Aquatic Organisms](#)"

21/02/ 2022

AUTHORS: Zheng, Y.; Nowack, B.

-Science Direct: "[Effects of natural organic matter on the joint toxicity and accumulation of Cu nanoparticles and ZnO nanoparticles in Daphnia magna](#)"

01/2022

AUTHORS: Qi Yu, Zhuang Wang, Guiyin Wang, Willie J. G. M. Peijnenburg, Martina G. Vijver



## NSC & 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, posters, training materials, newsletters, videos, briefings, policies, reports and so on.

Our Zenodo communities 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](#)





### Job title:

## PhD or postdoctoral contract on Raman spectroscopy: harmonisation and multivariate data analysis.

### We offer:

Fully funded 3-4-year PhD contract or 1-2 year postdoctoral contract at the Instituto de Catálisis y Petroleoquímica (ICP) of the Spanish National Research Council (**CSIC**) in the frame of **CHARISMA** European project. The activities will be based on the use of Raman spectroscopy for characterization (catalysts, plastics and other solid samples) and will include a strong effort on data harmonization and analysis. The candidate will work in an exciting international environment and participate in an expanding team strategically located in the capital of Spain. The research activities will be developed in Madrid with stays in European countries, and in close collaboration with an industrial partner for the implementation of real-time *in situ* Raman spectroscopy for quality control in the industrial production of catalysts.

### We are searching for:

An outstanding candidate with a strong academic background, ideally with research experience from the BSc and MSc studies. Knowledge of **spectroscopy** (preferably Raman), **multivariate analysis** (for calibration and classification/prediction) and **programming** (preferably Python) is a must. The candidate is hard worker and exhibits **independent thinking** and analysis capacity, learns fast, and possesses good technical writing ability and verbal communication skills in **English** (ideally also in Spanish).

### Requirements:

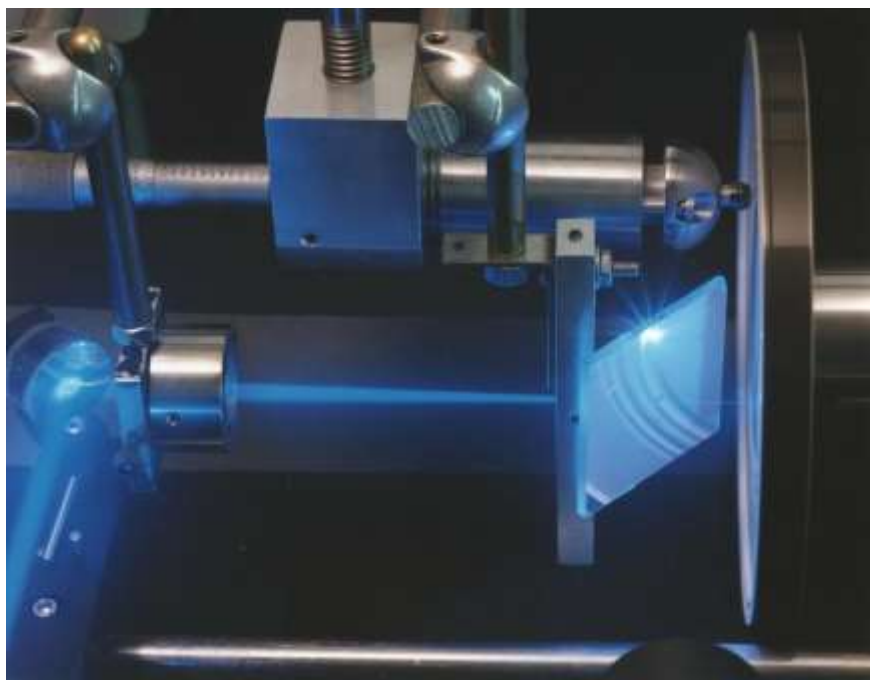
The position is open for candidates that hold either a **PhD** (for postdoc) or a **MSc** non-older than 4 years with minimum score of 65% (for PhD). The title must be **Spanish or legally equivalent**. Please check if you fulfil the **requirements of the CSIC's job bank for the corresponding type of contract**.

### How to apply:

Please fill this **form** if you're interested. Besides, full applications should be sent to [raquel.portela@csic.es](mailto:raquel.portela@csic.es) with the subject: "*candidate for Raman spectroscopy*". The application should include a **CV**, a **cover letter** describing why the candidate should be considered for this position, and a list of two professors/advisors who are willing to provide a **letter of recommendation**.

### Link to this offer:

<https://saco.csic.es/index.php/s/yCEXAi47QknDHsZ>





## Job title: RESEARCH FELLOW – LIFE CYCLE ASSESSMENT (LCA)

**Job Reference:** Ref.08.22.34

**Employer:** International Iberian Nanotechnology Laboratory (INL)

**Location:** Braga, Portugal

**Group/Unit:** Nanosafety

**Number of Vacancies:** 1

**Employment Type:** Full time

**Contract Duration:** 12 months

**Open Date for Applications:** August 5th, 2022

**Closing Date for Applications:** September 4th, 2022, 23h00m (Lisbon Time)

### Overview

The Nanosafety Research Group is dedicated to research on developing methods to assess the toxicity and safety of nanomaterials, with a broad approach evaluating from possible effects on humans to environmental effects. The goal of the Nanosafety group is to evaluate cytotoxic, genotoxic, inflammation, local and systemic effects and in silico analysis.

Are you an experienced Researcher in Life Cycle Assessment (LCA)? Would you like to be a key player in the development of the LCA competence at INL?

INL is seeking a Post-Doctoral Researcher with expertise in the field of computational analysis of life cycle, to evaluate the environmental impact of nanomaterials. The selected candidate will be working with a multidisciplinary group within a project dealing with "food nanostructures", "environmental impact of nanomaterials" and "in vitro nanotoxicology", under the SbDToolBox - Nanotechnology-based tools and tests for Safer-by-Design nanomaterials project, funded by funded Comissão de Coordenação e Desenvolvimento Regional do Norte (N2020), with reference number NORTE-01-0145-FEDER-00004.

### Duties

- Evaluation of the Life Cycle of nanomaterials used in the SbDToolBox and other projects applying ISO 14000 standards — specifically, 14040 and 14044M;
- Integration of the data from the different projects of the SbDToolBox project leading to LCA analysis;
- Development of new LCA models adapted to nanomaterials;
- Writing original articles as leading author, related to the LCA analysis within the SbDToolBox project;
- Participate in the writing of grants to push forward the LCA competence at INL.

### Mandatory Qualifications

#### Education

PhD Degree in Chemistry, Environmental Sciences, Computational Sciences, and related areas.

#### Experience & Technical Skills

Experience in the field of Life Cycle Assessment, showing independence in the handling of data and publication of scientific articles.

Research experience in the field of environmental sciences.

Good understanding of environmental toxicology.

*"Working at INL is more than working in science, it's an opportunity to be a part of something that impacts the world."*

*When you join INL, you'll have the chance to work alongside some of the brightest minds. It's rewarding and challenging to work in an inspiring environment.*



bio  
cera  
mics | 32

Symposium and Annual Meeting of the  
International Society for Ceramics in Medicine

SEPTEMBER 20-23, 2022  
VENICE MESTRE, ITALY

CONFERENCE CENTRE NH LAGUNA PALACE

## Welcome to Bioceramics 32. welcome to Venice!

The *International Society for Ceramics in Medicine (ISCM)* invites you to attend **Bioceramics 32**, the 32nd Symposium and Annual Meeting of ISCM, on **September 20-23, 2022**.

Bioceramics32 will be held in Mestre, just at the border of Venice, worldwide known for its unique historical relevance and for the incomparable architecture and magical scenery dominated by canals, waterways, and magnificent palaces making Venice one of the major centre of the Renaissance.

The conference, hosting material scientists, industrial and clinicians from all over the world, offers a unique opportunity to participate to a highly trans-disciplinary event covering the development and application of ceramic-based systems.

The mission of the conference is to highlight the key role of ceramic-based biomaterials in fostering new sectors of medicine, particularly for tissue regeneration, nanomedicine for theranostics, and new emerging topics including "Antibacterial Materials", "Nanosafety", "Skin Care" and "Circular Economy"

**"Relay race" Symposia** will be particularly dedicated to presentations showing the "passing of the torch" from material scientists to clinicians, to highlight advances and successes in technology transfer "from the bench to the bed".

**Special Sessions:** We are honoured to host the Scientific Session: **Antibacterial Bioceramics for Smart Prosthetic Applications**", organized and sponsored by the **American Ceramic Society**.

We will give also special attention to the aspects related to the translation of Bioceramics to clinics and market: *Regulatory Aspects & Certification* and *Tech Transfer process to overcome the "Death Valley"*

Additional **Special Events** are proposed for the kind attention of the participants:

- *Research Ideas for the market:* Competition of Innovative ideas in the field of ceramics for medicine, and related issues on biotechnology and biomedicine. This Competition aims to encourage talent Young Researchers towards "research ideas at the frontiers of Knowledge" and/or to identify collaborative routes with business and local communities on innovative projects dealing with materials for medicine.
- Some special workshops organized by Companies dealing with Materials in Medicine; Young Researcher Competition dedicated to PhD students and early stage Post-docs: Best oral lecture, Best poster.  
Round Table on Infections at the end of the specifically dedicated Session.

Final programme available [here](#)

Abstracts: [abstracts@bioceramics32.org](mailto:abstracts@bioceramics32.org)

General information: [info@bioceramics32.org](mailto:info@bioceramics32.org)

Registration: [registration@bioceramics32.org](mailto:registration@bioceramics32.org)



## CHARISMA Raman School 2022

18 - 19 October 2022

Turin, Italy



### Registrations are open!

The [H2020 CHARISMA Project](#) invites you to the [Raman School 2022](#) which will take place on 18-19 October 2022 in Turin, Italy.

As the preceding satellite event of this year's [VAMAS](#) (The Versailles Project on Advanced Materials and Standards) Steering Committee Meeting, the CHARISMA Raman School 2022 aims to attract Raman scholars and manufacturers from all over the world to get together and exchange information and ideas about the current state of Raman-related research.

The CHARISMA Raman School 2022 will be hosted by [INRiM](#) (Istituto Nazionale di Ricerca Metrologica) in its facilities.

#### Benefits of attending

- Gain a deeper understanding of the latest trends and progress in the field of Raman spectroscopy
- Get involved in the Raman community and engage with peers and experts
- Benefit from networking opportunities through social gatherings and get to know other experts from VAMAS and other participating projects

#### Who should attend?

- Early-stage researchers, post-docs and senior researchers
- Industry practitioners
- Standardisation and regulatory representatives

#### Contacts:

##### Scientific enquiries

Miguel A. Bañares (CSIC), [miguel.banares@csic.es](mailto:miguel.banares@csic.es)

Raquel Portela (CSIC), [raquel.portela@csic.es](mailto:raquel.portela@csic.es)

##### Local support and logistics

Luca Boarino (INRiM)

[l.boarino@inrim.it](mailto:l.boarino@inrim.it)

##### Organisation and administration

Judith Friesl (Yordas Group),

[j.friesl@yordasgroup.com](mailto:j.friesl@yordasgroup.com)

Yasemin Ertugrul (Yordas Group),

[y.ertugrul@yordasgroup.com](mailto:y.ertugrul@yordasgroup.com)

For information about the topics, speakers and the draft agenda, use [this link](#)

#### Contributors:



MicroplastiX



PlasticHeal-CUSP



CSIC-iLink



VAMAS



FAIRmat





**APCE & CECE & ITP 2022  
Angkor Wat, Cambodia  
November 6th-10th 2022**



**Joint Meeting of the 18th Asia  
Pacific Symposium on  
Microscale Separation and  
Analysis and 17th  
International Interdisciplinary  
Meeting on Bioanalysis**

Analytical and environmental scientists of Asia-Pacific and European regions are having a joint meeting for the first time, to exchange scientific ideas, progresses, and urgent issues, and to get acquainted with each other for future collaborations.

The theme of the joint conference will be "Better lives through better bioanalytical and environmental analyses". It is essential to assess the current biomedical and environmental situations correctly before prescribing any remedies. Thus, it is imperative to better the tools to analyze the biomedical and environmental status.

One of the themes of the International Union of Pure and Applied Chemistry (IUPAC) Special Sessions, organised by the Chemistry and the Environment Division will be "microplastics in the environment" which draws public concern worldwide recently.

"The Environment, Health and Food Safety Impact of Microplastics"

"Per- and Polyfluoroalkyl Substances (PFASs) in the Environment"

The IUPAC sessions will discuss the state of art tools to analyze microplastics in the environment and the current status on health effects of microparticles.

**Chair of Local Organizing Committee:**

Doo Soo Chung

Department of Chemistry, Seoul National University

E-mail: [dchung@snu.ac.kr](mailto:dchung@snu.ac.kr)

[www.APCE2022.org](http://www.APCE2022.org) |

[www.CE-CE.org](http://www.CE-CE.org) |

[www.ITP2022.org](http://www.ITP2022.org)



Plans are underway for the NMBP-13 Projects' Final Conference  
**'Future-proof Approaches for Risk Governance - Lessons Learned from Nanotechnologies'**

**SAVE THE DATES: In person—24th & 25th January 2023, OECD, Paris  
Online—31st January 2023**



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