



Welcome and overview:

Welcome to the 9th issue of the NanoSafety Cluster Newsletter. On behalf of WG7 Dissemination, THANK YOU to all contributors.

This issue heralds a new era for the NanoSafety Cluster: after seven years under the aegis of FIOH, a new co-ordination team has big boots to fill—and they will no doubt stretch them with dynamic plans to drive the NSC forward (see page 2). First on the agenda, however, is the NSC Compendium 2017—your go-to resource for all NSC Project information. See page 2 for details of how to submit your contributions

Following these updates, you can read about the outcomes of recent NSC meetings held in Malaga and Venice this year, as well as an overview of the Governance Task Force Meeting. The latest NSC initiatives, such as ScienceOpen, which provides a website to search and filter literature, and guidance on how to bring your nanosafety research to standards are described on pages 7-9 before a detailed section on the latest developments in the NSC projects.

NSC Project News highlight project outcomes—including the significant progress made by the eNanoMapper initiative. On page 19 you can find out how the results of the NANoREG project have been integrated in the framework for the Safety Assessment of Nanomaterials. As NANoREG Project Manager Aart Dijkzeul states “The opening up of the NANoREG Legacy fits in – and expresses - the growing awareness in the nanosafety community that collaboration and sharing of information is the only way to make real progress in nanosafety research”.

In the Workshop and Conference reports section, three projects demonstrate the benefits of exploiting events and collaborative opportunities, with NanoFASE, Innanopart, and NanoDefine joining forces for data analysis, NanoStreeM successfully hosting a satellite workshop at the NanoSafe 2016 conference; and a joint OECD-ProSafe conference, 180 international experts debated the regulatory relevance and applicability of EHS results over 10 years. Continuing this collaborative theme, our publications section highlights joint output by the NanoTOES, QualityNano & PANDORA projects.

If you are looking to explore new pastures, a number of research opportunities are advertised before a comprehensive listing of key events this year.

As always, we hope you find this issue of interest. There is no newsletter without your contributions, so please let the community know about your project, activities, events and continue to submit your articles and items.

On behalf of WG7 Dissemination
Lesley Tobin



The production and editing of this newsletter was kindly supported by the NanoDefine project (Grant Agreement 604347 under the EC's 7th Framework Programme).

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A NEW ERA FOR THE NANOSAFETY CLUSTER

By Iseult Lynch
University of Birmingham



After 7 years at the helm, the FIOH team led by Dr. Kai Savolainen are handing over the reins of coordination of the NanoSafety Cluster.

The Steering Committee spent several months pre- and post- Christmas 2016 grappling with the shape that the NSC should take going forward, and it's key priorities for focus and growth. Based on these exchanges, via email, teleconference and face to face meetings in Grenoble and Malaga, it was decided that a Coordination Team would take on the task of leadership of the NSC.

Overall coordinator is now Prof. Eva Valsami-Jones from the University of Birmingham (UoB) and coordinator of the H2020 project ACEnano, supported by Flemming Cassee from RIVM, Andreas Falk from BNN, and Iseult Lynch (also UoB).

Stay tuned for lots of new developments including a re-vamp of the NSC website, the launch of an annual conference and nano-exploitation days, and lots more. A summary document is available for review – while the official consultation period is closed, comments and suggestions are always welcome (email to t.carney@bham.ac.uk).

We look forward to building on the excellent work from Kai and his team at FIOH, and to transitioning the NSC towards innovation governance, and playing a central role in provision of scientific expertise in nanosafety from across the NSC community to guide industry and regulators as they move forwards towards commercialisation of nano-enabled technologies.



EUROPEAN NANOSAFETY CLUSTER COMPENDIUM 2017

The new NSC Compendium is planned to be released at the ESF in Malta on 23rd June 2017.

- Inputs are required from all new, running and ended projects by 2nd June 2017.
- Templates are available from <https://www.nanosafetycluster.eu/home/european-nanosafety-cluster-compendium.html>
- Please email all inputs to the compendium (including the metadata template) to nanosafetycluster@gmail.com

New for 2017 will be a section on *Internationalisation* whereby we will be featuring collaborative activities in nanosafety across a range of countries. If your project has international collaborators, please complete the additional internationalisation template for inclusion in this section.

About the NSC Compendium

We are now at the tipping point whereby the number of H2020 projects exceeds the number of FP7 projects still running. The focus of investment and research has moved increasingly towards predictive and high throughput approaches to nanosafety, including safety-by-design, bioinformatics, and the utilisation of nano-characterisation and safety datasets to support regulation and nanoproduct commercialisation.

The NSC Compendium is a synthetic guide to running FP7 projects, and H2020 projects providing exciting insights into the state-of-the-art collaborative research occurring across Europe. Updates from the NanoSafety Cluster Working Groups (WGs) are also provided.

Please click on the link below to view the July 2016 version of the European NanoSafety Cluster Compendium, to learn about our H2020 projects as well as the running or recently completed FP7 projects.

<https://www.nanosafetycluster.eu/home/european-nanosafety-cluster-compendium.html>



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REPORT FROM THE NANOSAFETY CLUSTER MEETING—MALAGA

Introduction

By Maxence Viallon
Dissemination Manager
LEITAT
<http://ipo.leitat.org/>



On the 6th of February, the Nanosafety Cluster met in Malaga during the preparatory meetings of the “New Tools and approaches for nanosafety assessment” conference, jointly organised by 5 of the large FP7 projects. The cluster took the occasion to meet the day before the conference in the hotel where the event was taking place. The attendance was high as this meeting was a strategic moment for the cluster due to its change in the coordination group and restructuring in the cluster organisation.

After 6 years, Kai Savolainen from FIOH passed the coordination of the cluster to Eva Valsami-Jones and Iseult Lynch who will lead the cluster activities for the next 4 years. Changes were made regarding the cluster structure and management model. The European Commission was present during the meeting to offer a vision to the cluster about the importance of the activities of the cluster.

Outcomes of the Meeting:

Decision on the future coordination of the NSC

Chair: Dr. Kai Savolainen

1. Welcome and opening remarks

The Coordinator of the NanoSafety Cluster, Dr. Kai Savolainen from FIOH welcomed the participants to the Meeting. Dr. Savolainen noted that electing a new Coordinator for the NSC, because the coordination of the NSC by FIOH ends at the end of March 17, is the only agenda item of the Meeting.

Dr. Nicolas Segebarth gave the opening remarks on behalf of the EC. He thanked Dr. Savolainen for the important steps made in the coordination of the NSC during the last six years. He noted that the timing of the change in the coordination is critical as regards to the Framework Programme’s work programme for the next two years, and especially to the challenges related to the next Framework Programme FP9. There is a need for the Cluster to show its value as regards to FP9. Dr. Segebarth also informed the audience about his forthcoming change of Commission unit in a couple of months.

2. A proposal for the future coordination of the NanoSafety Cluster 1.4.2017-2021

Prof. Iseult Lynch, University of Birmingham, gave a presentation on the proposal prepared together with several key experts of the Cluster. She stressed that the proposal presented is a draft, which still has to be finalized.

Prof. Lynch proposed that the Meeting would agree about the general vision, the priority core activities and the general structure of the Cluster as well as the composition of the Steering Group. In addition, the aim for the Meeting was to agree the mandate and leadership of the Cluster. Prof. Eva Valsami-Jones was suggested to be the successor of Dr. Kai Savolainen as the Coordinator. To support the coordination, a Coordination Team consisting of Dr. Flemming Cassee, Mr. Andreas Falk and Prof. Iseult Lynch, in addition to the Coordinator, was proposed.

Prof. Lynch presented a list of current NSC projects, some of which are going to end relatively soon, but many are H2020 projects, which continue still for years. Integrating 2 projects to the Cluster activities and their sponsorship for selected Cluster activities is of a vital importance. Prof. Lynch presented a vision for the NSC, in which the NSC functions as a high profile platform for coordination of nanosafety research in Europe. Over time, the goal is the transition of the NSC to an Innovation Governance platform, as discussed in the last NSC meeting in Grenoble. Therefore a key aspect of the period 2017-2021 will be to work with the Steering Group and the Governance Task Force to develop a profile attracting users (stakeholders from fundamental research to market players) and facilitate the transition.

The four core areas for the Cluster were proposed as follows:

- Coordination of future EU nanosafety science policy (via the Steering Group)
- Coordination of ongoing EU nanosafety science (SG via WGs and Task Forces)
- Ensuring continuity and sustainability of EU research (SG, Sustainability Task Force, Data Management WG)
- Maximizing impact and uptake by stakeholders (via dissemination activities, bespoke stakeholder events)



The proposed structure of the NSC would comprise a Steering Group, a Coordination Group, a Communication Group, Working Groups and Task Forces. The Steering Group was proposed to include the coordinators of the 9-10 NSC projects in order to integrate the projects better into the Cluster. In addition the SG would include the Coordination Team, the Communications Group lead (and potentially the Chairs of the WGs). The number of WGs would be reduced (from the current 10 to 4-5). The proposal also included plans to increase the transparency of project contributions to the NSC and to estimate the expenses/costs of various activities. The list of proposed activities was based on the current NSC activities and proposed additional core activities such as the annual conference.

3. Discussion on the future coordination

In the discussion the following points were presented:

- The final list of activities has to be agreed by the Cluster members
- The budget issues and the 2% contributions of the individual projects have to be agreed in more detail.
- The contributions in the form of person months can come from the projects but also from the organizations, if they are willing to contribute. The activities will depend on the funding available.
- Single point of contact/coordination was proposed instead of a shared coordination in order to clarify the roles and a contact point to, for example, the Commission. It is clearer to have somebody personalized as a coordinator
- The issue of risk assessment could be addressed by a Task Force. The Cluster itself does not do risk assessment, though.
- 17 people in the Steering Group was deemed quite a large number; the size depends mostly on the number of project coordinators included.
- The idea of organizing an annual conference was supported. The Forum for Young Scientists is a training event and should be maintained.
- Handling the data would be an important task for the Cluster
- The role of the Coordination Team would be a coordinating unit, implementing the decisions of the SG.
- All members of the Cluster are encouraged to be active in finalizing the proposal, which will be posted on the NSC website for comments.
- The idea of Task Forces, active for a certain period and with a clear objective, was supported.
- The number of WGs and their relationship to the EU-US CoRs are to be discussed in detail.
- A manual of procedures for the coordination group, the project coordinators, the WGs and TFs etc. should be created.

4. Decision on the future coordination of the NSC

In accordance with the proposal, Prof. Eva Valsami-Jones was chosen as the forthcoming Coordinator of the Cluster. Also the proposition to form the Coordination Team composed of the Coordinator, Dr. Flemming Cassee, Mr. Andreas Falk and Prof. Iseult Lynch was accepted.

It was agreed that reducing the number of the Working Groups will be further discussed but some of the effective Working Groups are going to be maintained in any case.

The Steering Group would include project coordinators in addition to the Coordination Team and the Chair of the Communication Group. The relation between the Steering Group and the Coordination Team is still to be discussed in detail. The role of WG Chairs to be agreed.

It was agreed that the functionality of the proposed Cluster structure and the Steering Group will be evaluated in a year or two. Prof. Eva Valsami-Jones stressed that a wide involvement of the projects in the Cluster activities and decision making was desirable. Dr. Kai Savolainen concluded that the last item of the proposal, the sponsorship of the individual projects for selected Cluster activities, does not need to be agreed in this Meeting.

5. Closing of the Meeting

On behalf of the whole Cluster, Prof. Eva Valsami-Jones cordially thanked Dr. Kai Savolainen, Dr. Georgios Katalagianakis and Dr. Nicolas Segebarth for their work and support for the Cluster.

Dr. Savolainen closed the Meeting at 18.00

For more information:

William Davis of Insight Publishers Ltd writes:

As dissemination partner for NanoSolutions, Insight will be producing a broad-focus executive summary of the NSC event in Malaga. It will also have information about the subjects covered in the talks and presentations, and a brief overview of the stakeholder engagement.

The whole event has been filmed as well and the summary report will contain links to the summary film and key interviews as well as information about where and when each of the presentations will be available to view. The executive summary will be available digitally on the Nanosolutions website and will be sent out to the large database of the project as well as to the databases of the participating projects as well. Insight will also be sending it to a wide variety of public and media connections, in an effort to raise the issue of nano safety and the work being done to address this. The summary report and video links will be accompanied by a press release to these people.



REPORT FROM THE NANOSAFETY CONFERENCE—MALAGA

Co-organised by GUIDEnano, NanoSolutions, eNanoMapper, SUN and NanoMILE

By Iseult Lynch
University of Birmingham, on behalf of the five projects

New tools and approaches for nanomaterial safety assessment

NANOSOLUTIONS, SUN, NanoMILE, GUIDEnano and eNanoMapper



The week of 6-9th February saw the European nanosafety community converge in Malaga for the “New tools and approaches for nanosafety assessment” conference, jointly organised by five of the large FP7 projects ending around now. The five projects were: the sister projects [NanoSolutions](#) and [NanoMILE](#), who were investigating mechanisms of toxicity of nanomaterials and developing mechanistic-based classification and grouping approaches, the sister projects [GUIDEnano](#) and [SUN](#) focussing on development of tools for risk evaluation and mitigation and decision support tools to support industry and regulators, and [eNanoMapper](#) project focusing on developing an ontology, data infrastructure and modelling tools for nanosafety.

The conference showcased the outputs from 3 to 4 years of research from these 5 projects, via keynote presentations and short highlight presentations, as well as featuring short presentations from experts across Europe and beyond selected from the submitted abstracts. Overall, there were 75 short presentations, 2 posters sessions (close to 100 posters) and 2 panel discussions, one focussing on “Stakeholder engagement – lessons learned and the path forward for H2020 projects – multi-stakeholder perspectives” and the other addressing “Ensuring the legacy of EU-funded project outputs: strategies and supports needed” featuring panellists from the USA, Brazil, EU and spanning industry, industry organisations, funding agencies, standardisation bodies, international organisations, large enterprise and regulatory and policy organisations.



Figure 1. Panel for discussions on stakeholder perspectives

A report on the stakeholder discussions is in preparation and will be shared with the community in due course. However, the key message was that a huge body of data has now been generated, and the quality of the data presented across the 3 days was complemented, but there is now a real need to integrate this dataset into clear, consistent key messages for use by industry, regulators and policy makers.

A best poster award, sponsored by RSC journal [Environmental Science: Nano](#) was presented to Susan Dekkers from RIVM for her poster entitled “[The influence of redox activity of inhaled nano-sized cerium dioxide on respiratory, immune and cardiovascular effects in multiple mouse models](#)”. This was selected by a panel of roving judges who assessed the posters over the 2 days.

The 226 participants came from all 28 countries, including most of the EU member states, as well as South Africa, USA, Brazil, China, South Korea and Japan (see Figure 2 for breakdown). For those that couldn't be present, the entire conference has been recorded, and will be made available online via a dedicated landing page hosted by [Inclusive Digital](#) as well as via the individual project websites and with links from the [EU Nanosafety cluster](#) webpage.

Several short movies are also being prepared, featuring interviews with the various project coordinators, members of the stakeholder panels and more. Tweets were tagged with #nmsa2017.

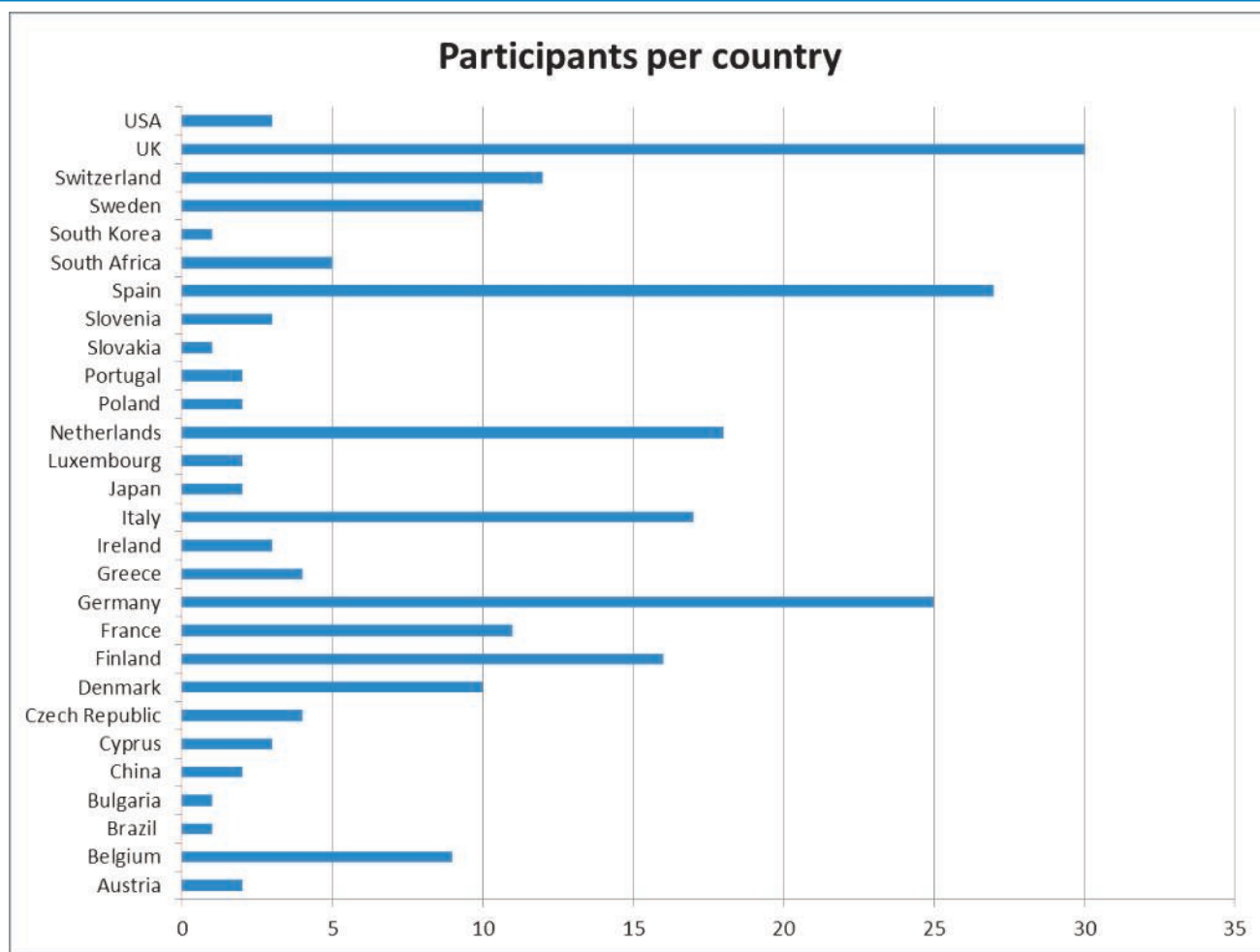


Figure 2: Distribution of participants from EU member states and 3rd countries.



NSC GOVERNANCE TASK FORCE MEETING - VENICE

A Task Force Meeting for establishment of an EC Risk Governance of Nanotechnologies was held in Venice on March 1st, 2017

Minutes from the meeting are available here.

https://www.nanosafetycluster.eu/uploads/NSCMeetings/Docs/Venice/2017/NSC_Venice_minutes_010317.pdf

Presentations:

- Katalagarianakis: [Explanation of the needs of the EC action on nano-risk governance](#)
- Hristozov: [The Society for Risk Analysis – NanoSafety Cluster Round-table initiative on Risk Governance of Nanotechnologies](#)
- Trump & Linkov: [The Society for Risk Analysis – NanoSafety Cluster white paper: Understanding tools to drive prevention-based risk governance of nanotechnologies](#)
- Stone: [A Risk Governance framework for current and future nanotechnologies](#)
- Mullins: [Risk transfer for nanotechnology risk governance](#)
- Alstrup Jensen: [caLIBRAte project](#)



A SCIENCE OPEN COLLECTION OF NANOSAFETY CLUSTER PUBLICATIONS

<http://scienceopen.com/>

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DOI: [10.6084/m9.figshare.4725424.v1](https://doi.org/10.6084/m9.figshare.4725424.v1)

Central to a strong NanoSafety Cluster (NSC) is efficient dissemination of knowledge. However, the flood of peer-reviewed literature requires one to make a selection of articles to read. Indeed, in the period 2003-2013 the number of nanosafety papers increased from just 60 published during 2003 to 2846 published in 2013 (Krug 2014), and that trend has certainly continued through 2016. Twenty years ago, PhD students would just read the table of contents a selection of journals. Rich Site Summary (RSS) feeds are the modern reincarnation of this process (Murray-Rust et al. 2004). At the same time, research has become a lot more interdisciplinary and nanosafety research is an eminent example of that. NYU new-media Professor Clay Shirky explained, however, that it is not an information overload, but a filter fail (Asay 2009). It is not that we have too much to read, but that we fail to select the right papers to read. That requires intelligent indexing, allowing readers to find the articles specifically about the nanomaterial they are interested in, with exactly that biological effect they expect or found in their own work.

Where the eNanoMapper project developed a search engine to filter nanomaterial data (<http://search.data.enanomapper.net/>) (Jeliaskova et al. 2015), ScienceOpen provides a website to search and filter literature. One of the newer features allows the creation of collections papers on a specific topic or from a specific group of authors. Using a long list of DOIs with papers up to 2014 from EC-funded projects under the NSC umbrella, we created a collection of articles: <https://www.scienceopen.com/collection/EUNanoSafety> (see Fig. 1).



Figure 1: Screenshot of the EU NanoSafety Cluster publication collection in ScienceOpen (until 2014).

The collection contains more than 600 papers, and has a collected #altmetrics attention score (Kwok 2013) of almost 900. The number of ratings and recommendations, however, is still minimal, but the NSC community is welcome to leave comments. Articles in the collection can be filtered by, for example, publisher or journal and sorted on, for example, #altmetrics attention score and citation count. The background image of the collection originated from an Open Access figure from a paper from Carmen Vogt et al. (Vogt et al. 2015)

Next steps

The collection currently has articles up to 2016. However, the cluster is currently not systematically collecting DOIs (although the Research Participant Portal reporting system does have that option and certainly collects published outputs). The OpenAIRE platform (<https://www.openaire.eu/>) has started collecting output (article, but also software and data publications) (Houssos et al. 2014), but does not have a complete list either and is not limited to only the NSC. Therefore, collecting DOIs of more recently literature is high on our agenda within the Database Working Group of the NSC (<https://www.nanosafetycluster.eu/working-groups/4-database-wg.html>).



Second, we have started discussing integration with data infrastructure. For example, we are exploring if it is possible to create links between NSC articles and entries in the eNanoMapper database. But this requires better data integration between the resources. For now, links to follow up papers, data, etc. can be provided as comments to the paper.

To complete the collection, NSC projects are kindly invited to email DOIs of papers funded by that project to egon.willighagen@gmail.com. The collection itself has a DOI too, and thus can be cited with DOI 10.14293/S2199-1006.1.SOR-UNCAT.CLVVPKP.v1 (Willighagen 2017).

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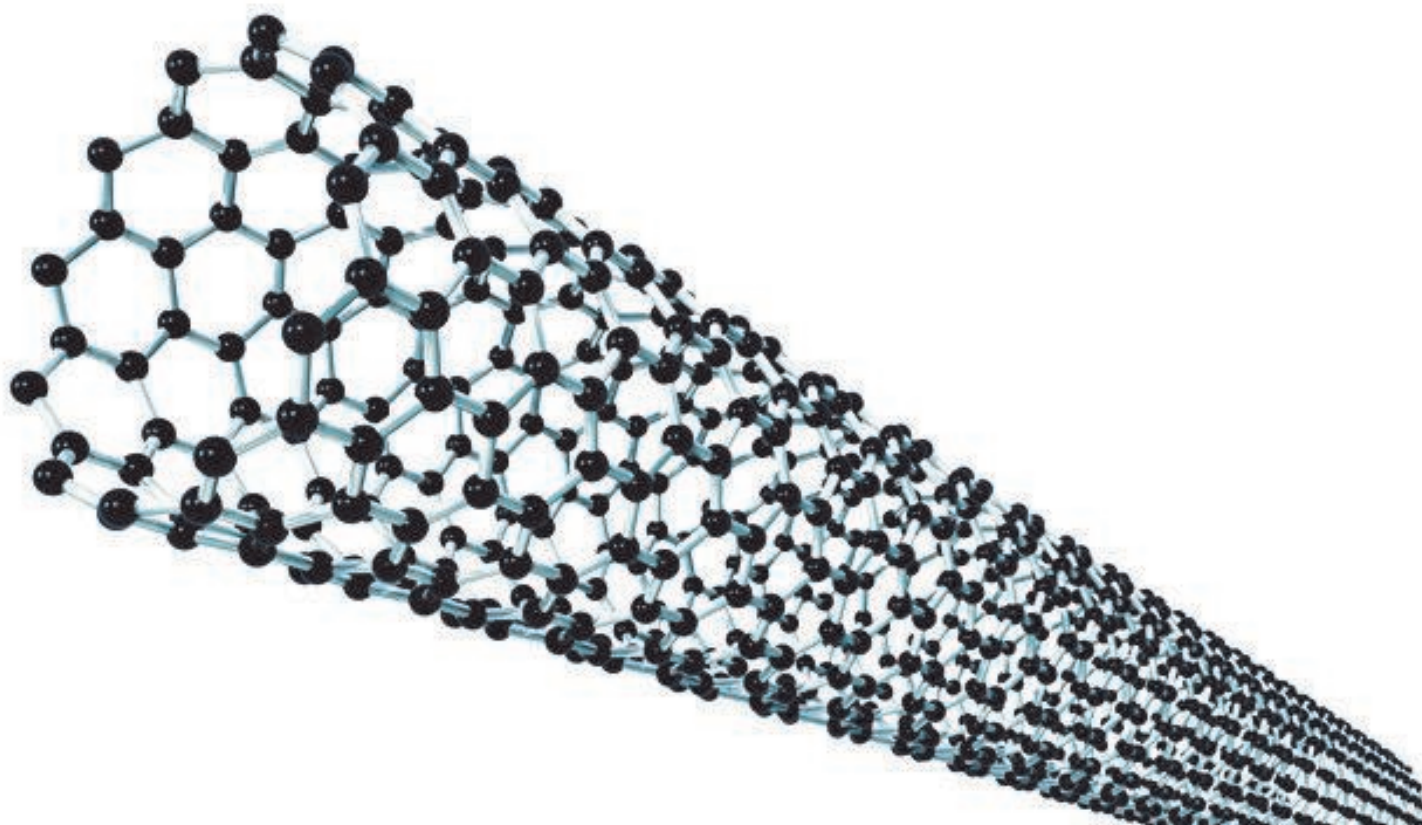
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GUIDANCE FOR STANDARDISATION ON THE NSC WEBSITE

Benoît Hazebrouck, EU-VRI (NanoMILE), Maxence Viallon, LEITAT (GUIDEnano) et al.

Introduction

The Standardization sub-group has published guidance on how to bring nanosafety research to standards. It includes general information about standardization, what exists currently in the field of nanosafety, how to bring concretely research to standardization, and more.

The guidance includes various links to reference documents in the field of standardization that can help researchers to develop a standard.

How to bring your nanosafety research to standards?

A comprehensive set of guidance is now available on a [specific page](#) of the NSC website. This set is made of 21 presentations and reports or links to such, and of further links. It includes for instance a list of Standards and Standardization Projects related to Nanotechnology established by DIN, and a step-by-step guidance from the early stage of a proposal. It is organized in the following sections:

- What is standardization? How does it work?
- The standardization landscape in the field of nanotechnologies and nanosafety
- Concretely bringing your research to standardization
- Support
- Putting it all together in the frame of R&D projects
- Thinking further: how to improve the system?

The webpage is based on results of the FP7 projects nanoSTAIR, QualityNano, Integ-RISK, NanoValid, Safe-Life-X, NanoMILE and Scaffold, and was realized as part of NanoMILE's standardization activities with the support of the GuideNano project.

For more information:

<http://www.nanosafetycluster.eu/working-groups/7-dissemination-wg/standardization/how-to-bring-your-nanosafety-research-to-standards-a-comprehensive-set-of-guidance.html>





NEWS ON THE PROGRESS OF THE NANODEFINE PROJECT

By Rudolf Reuther
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The EU FP7 NanoDefine project has entered its final year and most results have been achieved as planned. Main goal of the project is to create the analytical capacity and a measurement strategy that can support the practical implementation of the EU definition for nanomaterial. In the following main achievements obtained during the last six months in the various technical work packages (WP) are highlighted:

WP1 provided the project with substances and products covering various matrices (organic, inorganic, carbon-based, metallic) and applications (fillers, food, cosmetics, pigment, etc.), and challenging physical properties, such as materials embedded in matrix, significantly larger than 100 nm, heavily agglomerated, complex shape etc.). The material selection and distribution started at a very early stage of the project. Homogeneity and stability of selected materials were assessed and a characterization report released in February 2017. There was no evidence for any unexpected inhomogenities or instabilities (some products have a limited shelf life). The materials will be available upon request also after the end of the NanoDefine project. The figure below shows Transmission Electron Microscopy (TEM) micrographs of the inorganic particles found in sunscreen (left) and toothpaste (right).

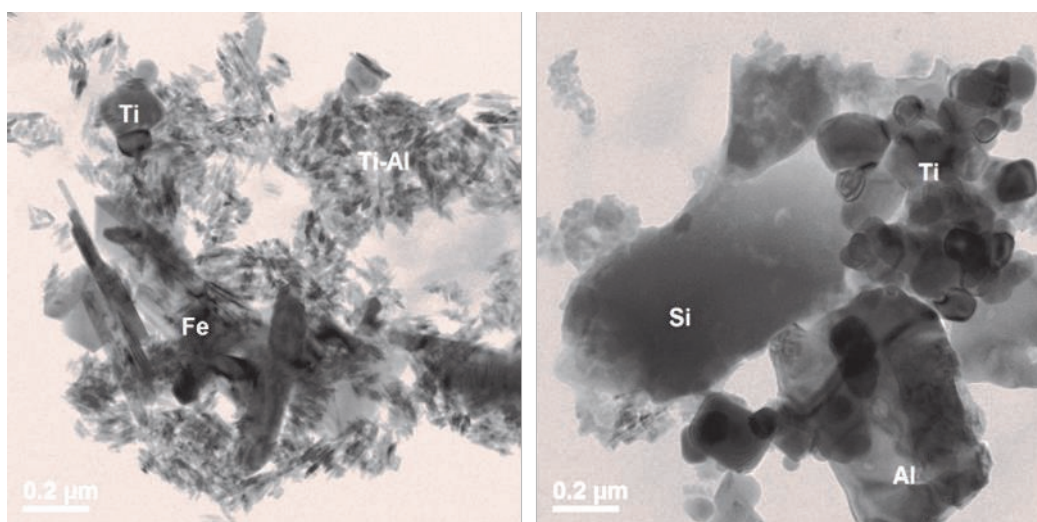


Figure: TEM images of the inorganic particulate contents in sunscreen (left) and toothpaste (right).

WP2 is assessing the influence of sampling on measurement uncertainty. Procedures tested included slurry, paste and heap sampling and using a spinning riffler, and test materials were coated titanium dioxide and fine and ultrafine grade barium sulfate as test materials. Heap sampling showed the highest variance independent of the selected material (more details available at: http://www.nanodefine.eu/publications/reports/NanoDefine_TechnicalReport_D2.7.pdf). Another technical report will be soon available at www.nanodefine.eu/publications, and will discuss and compare new protocols for functionalization and deposition methods.

In **WP3**, all work planned has been already accomplished including (1) a systematic evaluation of a broad range of available techniques against quantitative criteria to assess their applicability for the implementation of the EC recommendation, (2) the creation of a robust set of methodologies with the potential to be further developed into standard methods for the measurement of PSDs of nanomaterials according to the EC recommendation for a definition based on well selected, real-world materials, and (3) the evaluation of the relationship between the volume specific surface area (VSSA) and the number based PSD. The achieved results will be available in several publications: Babick et al., 2016, How reliably can a material be classified as a nanomaterial? Available particle sizing techniques at work, J Nanopart Res (open access), Babick and Ullmann, 2016, Error propagation at the conversion of particle size distributions, Powder Tech, Wohlleben et al., Reliable nanomaterial classification of powders using the VSSA method, J Nanopart Res (submitted), and Mielke et al., 2016, Evaluation of Electron Microscopy Techniques for the Purpose of Classification of Nanomaterials., Microsc Microanal.

A multi-element spICP-MS method was developed in **WP4** including 2 quadrupoles (NexION 350D, iCAP Q) 2 Time-of-flight (cyTOF 2, icpTOF) and using the following 4 nanomaterials composed of multiple elements: Au/Ag core/shell particles (60, 80 nm), BiVO₄ and (Bi_{0.5}Na_{0.5})TiO₃ particles, nano-steel (IRMM-383). ICP-TOFMS can quantitatively detect multi-element events within one particle and ICP-QMS instruments can semi-quantitatively detect 2 elements and qualitatively detect multi-element events within one particle.



Also, a HRMS method was tested and validated with a V range between 200 and 5000V corresponding to a mobility of 6 and 0.2 cm²/Vs and a size range (assuming charge +1) between 0.5 and 3 nm. Experiments are still ongoing. Other additional methods, such as DLS and MiniTEM have been tested for kaolin, CaCO₃, BaSO₄ (coarse), and coated TiO₂ in triplicates and SOPs developed and adapted. Another focus of the recent work in WP4 was the intra-laboratory validation of selected screening methods including spICP-MS, PTA, Disc-AC, Cuvette-AC, AUC, DLS, and MiniTEM. Work has been finished for spICP-MS, Disc-AC, Cuvette-AC, AUC and is still ongoing for PTA, DLS, and MiniTEM. Validation parameters included repeatability and intermediate precision, robustness tests on temperature variation, rotation speed, gradient composition, optical path length, ramp vs. single speed comparison (AUC) on ID-18 and robustness of evaluation software in terms of the lower size cut-off value (Disc-AC).

In **WP5**, a complete platform for a cost-efficient Flow-FFF instrument and software has been developed, including a “Superon” released VOYAGER CDS® controlling an HPLC with pump, autosampler, uv-detector, Eclipse FFF and thermostated cabinet, and a new SCOUT DPS® (Data Processing Software) software. In-house validation for both electron microscopy and FFF methods is still ongoing in close interaction with the validation WP6. WP5 will also contribute to the next 5th FFF-MS Workshop within the frame of the NORMAN network (WG4 – Engineered Nanomaterials): <http://umweltgeologie.univie.ac.at/hofmann-group/workshops/>. This workshop will take place from 28-29 September 2017 at the University of Vienna in joint cooperation with the Helmholtz-Centre for Environmental Research - UFZ Leipzig, Germany and The German Federal Institute of Hydrology (BfG). The scope of the Workshop will be “Nanoparticle analysis in environmental - & life-sciences as well as consumer products”.

In **WP6** (with focus on validation and standardisation), in-house validation of tier 1 (screening) methods and tier 2 (confirmatory) methods was started. The validations are based on a previously agreed validation guideline that assures a harmonized validation approach over the different methods and work packages. In-house validations are based on a detailed validation plan that lays down the validation parameters together with acceptance criteria. This validation plan itself is based on a written standard operation procedure (SOP) that describes the application of the method in all necessary details. The different methods are currently in different stages, first validation studies were already finished. Based on these validation reports, a decision on the methods that will undergo interlaboratory validation will be made.

In **WP7**, the 2nd edition of the NanoDefine Methods Manual (2015) is in preparation, including a material classification system, methods performance criteria, sampling and sample preparation and measurement methods, and annexes with SOPs, with recommendations for a revision of the EC definition of nanomaterial based on analytical possibilities. Also, a full decision support framework has been made available that is applicable to all relevant materials and based on knowledge generated in NanoDefine. The draft decision support flow scheme will guide users through the entire decision process and includes tier 1 screening methods for dispersions and powders, and tier 2 confirmatory methods. Finally, the development of the “NanoDefiner” e-tool has reached an advanced stage (close to Beta-version). Case studies are currently executed to test the performance of the decision flow scheme with NanoDefine Materials that have been extensively tested, but also additional OECD sponsorship program materials from the JRC repository, and materials with particular challenges.

New publication:

A new paper has been published on the potential of the volume-specific surface area (VSSA) to classify nanomaterials and non-nanomaterials. Based on the use of highly characterized benchmark materials from the NanoDefine EU FP7 project, a tiered screening strategy for the purpose of implementing the definition of nanomaterials according to the EU recommendation has been derived and applied for the classification of representative industrial materials. It is shown that VSSA could help to prevent false-negative classification, e.g. by electron microscopy. The study recommends to include the VSSA screening strategy in the technical guidance for the implementation of the EU definition. The paper is open access available at: <http://link.springer.com/article/10.1007/s11051-017-3741-x>.

Malvern publishes new standard

Finally MALVERN reports on the recent publication of ISO19430 on the subject of Particle Tracking Analysis, PTA (also known as Nanoparticle Tracking Analysis, NTA) represents another key moment in the acceptance and adoption of PTA as a legitimate method for the measurement of nanoparticulate suspensions / dispersions. The standard has been developed by an expert committee and supported by Malvern and other manufacturers in the field. The standard outlines key method parameters to follow and guide on validation to ensure users have confidence in the information generated.

Webinar with more information:

<http://www.malvern.com/en/support/events-and-training/recorded.aspx?eventpage=Recorded>.

Link to the standard:

http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=64890.

More information available at: www.nanodefine.eu.



THE LATEST NEWS FROM NANOVALID

Standardization

The following new work items (NWI) that are based on SOPs developed and proposed by NanoValid will be discussed during the next CEN/TC 352 meeting:

- ATP assay for measuring the effect of nanoparticles on cell viability:
- Decision trees
- Non-isotopic labelling of nano-objects
- Feeding of nanoparticles to isopodes
- Quantification of labelling of nano-objects



Contact for more information: Dr. Michael Schmitt, DIN (Michael.Schmitt@din.de)

New Publication

NanoValid has recently published a new major paper that describes the validation of in vitro assays to assess the toxicity of nanomaterials. Results are presented and discussed that have been achieved by a pan-European inter-laboratory study (ILS) on the suitability and reliability of three different cell viability assays (MTS, ATP content, and caspase-3/7 activity) with different readouts (absorbance, luminescence, and fluorescence) and inflammation assays (TNF- α and IL-1 β ELISAs), with the aim to evaluate Ag and CuO nanoparticles' toxicity and pro-inflammatory effects.

Common protocols for both cell cultures and in vitro assays have been developed and shared between all participating partners as well as same stock of cells and fetal bovine serum (FBS) batches. As nanoparticles have the potential to interfere with assays at several stages, special attention was paid to assay interference and specific procedures to address and consider this issue in the protocols of the in vitro tests. The study of "Piret et al., 2016, Pan European inter laboratory studies on a panel of in vitro cytotoxicity and pro inflammation assays for nanoparticles, Arch Toxicol" was one of the first attempts to test the suitability of several in vitro assays by ILS at an international level and is available at: <http://link.springer.com/article/10.1007%2Fs00204-016-1897-2>.



SMARTNANOTOX

SmartNanoTox—Smart tools for gauging nano hazards
Increasing the capacity to perform nano-safety assessment.



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A definitive conclusion concerning the dangers associated with human or animal exposure to a particular nanomaterial can currently only be made using complex and costly procedures including complete NM characterisation with subsequent careful and well-controlled in vivo experiments. We believe significant progress in nanotoxicity prediction can now be achieved using modern approaches based on one hand on systems biology, on another hand on statistical and other computational methods of analysis.

In this project, through a comprehensive self-consistent study, which includes in-vivo, in-vitro and in-silico research, we address main respiratory toxicity pathways for representative set of nanomaterials, identify the mechanistic key events of the pathways, and relate them to interactions at bionano interface via careful post-uptake nanoparticle characterisation and molecular modelling.

This approach will allow us to formulate a novel set of toxicological mechanism-aware end-points that can be assessed by means of economic and straightforward tests. Using the exhaustive list of end-points and pathways for the selected nanomaterials and exposure routes, we will enable a clear discrimination to be made between different pathways and relate the toxicity pathway to the properties of the material via intelligent QSARs.

If successful, this approach will allow grouping of materials based on their ability to produce the pathway-relevant key events, the identification of properties of concern for new materials, and will help to reduce the need for blanket toxicity testing and animal testing.

<http://www.smartnanotox.eu>



eNanoMapper SUCCESSFULLY ACHIEVES ITS GOALS

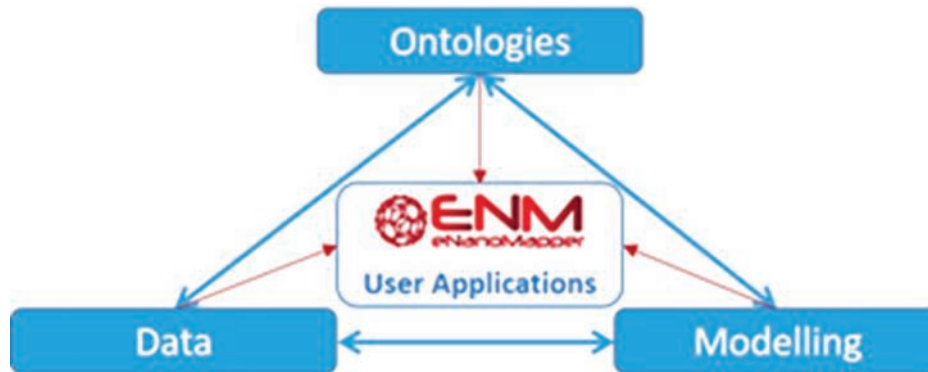
<http://www.enanomapper.net/>

Lucian Farcas

Douglas Connect GmbH

lucian.farcas@douglasconnect.com

Started in February 2014, eNanoMapper developed a computational framework for nanomaterials toxicological data, which is based on open standards, open source, common languages, and an interoperable design, enabling a more effective and integrated approach in risk assessment. eNanoMapper has supported the collaborative safety assessment for nanomaterials by creating a modular, extensible infrastructure for transparent data sharing, data analysis, and the creation of computational toxicology models.



The main achievements of eNanoMapper towards improved standards in risk assessment of nanomaterials and with an impact on the nanosafety community are represented by an agreed language formalized in a nano ontology ([Hastings et al., 2015](#)), an open platform for integrating different nanomaterials data sources providing access to open and confidential data ([Jeliazkova et al., 2015](#)) and the computational infrastructure, analysis and modelling tools for predicting toxicity of nanomaterials ([Tsiliki et al., 2015](#)).

Several NanoSafety Cluster projects have shown strong interest in the eNanoMapper data management and integration solutions, manifested by the NANoREG decision to transfer all data to an eNanoMapper database instance, and subsequent decisions of the new H2020 projects caLIBRAte, NanoReg2 and ACEnano to adopt the same solution.

The eNanoMapper approach supports the integration of non-testing methods into risk assessment ([Helma et al., 2017](#)), and facilitates a harmonised use of existing data and knowledge, enabling a significant reduction of animals used for nanomaterials toxicity testing ([Grafström et al., 2015](#)). The project also provides a rich library (<http://www.enanomapper.net/library/>) of information and documentation (tutorials, webinars, reports and publications) to support and guide the users.





A **review meeting** was organised in Malaga (Spain) on 6 February. The meeting has been attended by representatives of all eNanoMapper partners, together with Nicolas Segebarth (EC Project Officer), Cedric Notredame (Expert Reviewer) and Abdelqader Sumrein (ECHA). The major technical achievements addressing the needs of the customers, community outreach and dissemination activities were presented and discussed during the day.

Besides the technical progress, an emphasis was put on the exploitation strategy, and the effort needed in order to make the potential end-users aware of eNanoMapper services. Important is to get endorsement from high influential scientists and institutions and get further support for the development, maintenance and use of these applications. The interactions with NSC projects but also the collaborations established outside the NSC were presented and the strategy to continue outreaching the community was discussed.



The second day of the meeting, was dedicated to a **Hackathon** on data collection templates. The main goal of this half-day event was to make participants familiar with the eNanoMapper solutions for data management and data access, and demonstrate how the search interface available at <https://search.data.enanomapper.net/> integrates various data sets and how to use the application programming interface (API) to access data. The materials used for this hackathon are publicly available at <http://www.enanomapper.net/events/enm-hackathon-2017>

Online resources:

- eNanoMapper Public Reports: <http://www.enanomapper.net/library/reports>
- eNanoMapper application: <http://www.enanomapper.net/applications>
- EU NanoSafety Cluster modelling repository: <http://www.enanomapper.net/projects/>



INTRODUCING OPENRISKNET

www.openrisknet.org

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OpenRiskNet

RISK ASSESSMENT E-INFRASTRUCTURE

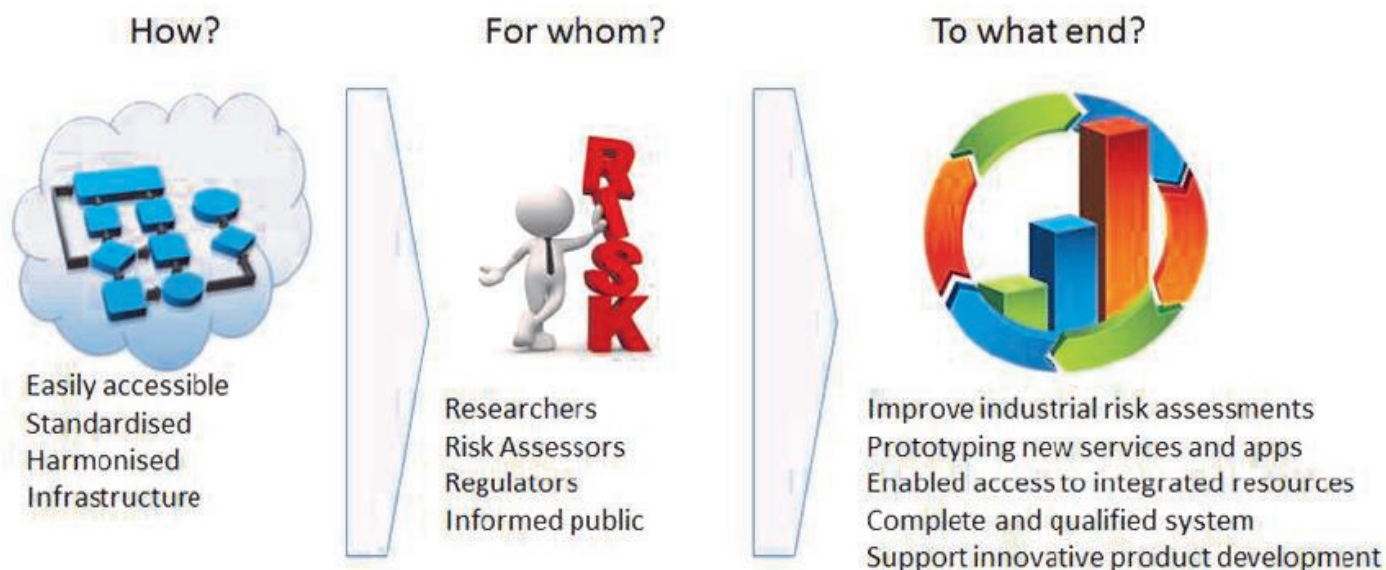
Open e-Infrastructure to Support Data Sharing, Knowledge Integration and *in silico* Analysis and Modelling in Risk Assessment
OpenRiskNet is a 3 year project funded under the Horizon 2020 EINFRA-22-2016 Programme (Project Number 731075; start date 1 December 2016). The main objective is to provide an open e-Infrastructure providing resources and services to a variety of communities requiring risk assessment, including chemicals, cosmetic ingredients, therapeutic agents and nanomaterials. OpenRiskNet will work with a network of partners, organized within an Associated Partners Programme.

One of the OpenRiskNet case studies will address specific needs identified by the nanosafety community. The case study will be defined based on project partners' experience in NanoEHS projects and activities within NanoSafety Cluster (NSC) working groups and task forces. Interactions with nanosafety projects have already been established in order to identify the key questions to be addressed, and where the OpenRiskNet infrastructure could be deployed and tested.

OpenRiskNet will support the sustainability and further development of the eNanoMapper infrastructure supporting NSC needs. It offers the potential to incorporate data and tools developed within the NSC within the broader European scientific infrastructure and to combine them with resources developed within other areas such as chemical safety assessment. Alignment and interoperability with the nano-specific characterisation extensions of the eNanoMapper ontology, protocols and templates, to be carried out within ACEnano, will be pursued.

Background

Toxicology and risk assessment are undergoing a paradigm shift, from a phenomenological to a mechanistic discipline based on *in vitro* and *in silico* approaches that represent an important alternative to classical animal testing applied to the evaluation of chronic and systemic toxicity risks. Large databases and highly sophisticated methods, algorithms and tools are available for different tasks such as hazard prediction, toxicokinetics, and *in vitro* – *in vivo* extrapolations to support this transition. However, since these services are developed independently and provided by different groups world-wide, there is no standardized way to access the data or run modelling workflows. To overcome the fragmentation of data and tools, OpenRiskNet will provide open e-Infrastructure resources and services supporting different scientific communities.



Develop + Deploy Integrated, Secure, and Sustainable e-Infrastructure



OpenRiskNet combines the achievements from earlier projects for generating modelling and validation workflows, knowledge integration and data management as well as including ongoing projects and important stakeholders through an associated partner programme.

The main components of the infrastructure will be an interoperability layer added to every service to describe the functionality and guaranteeing technical and semantic interoperability, a discovery service, deployment options based on container technology, and packaging of the infrastructure into virtual instances. This will be complemented by training and support on integration of specific services based on prototype implementation, usage of standard file formats for data sharing including the generation of templates for data and metadata, as well as the harmonized usage of ontologies.

Case studies will demonstrate the applicability of the infrastructure in productive settings supporting research and innovation in safer product design and risk assessment.

Associated Partner Programme

To ensure the usability of the infrastructure, alignment with the community as well as to pursue complete coverage of important tools, OpenRiskNet works with a **network of partners, organized in the Associated Partners Programme**. The Programme aims at strengthening the working ties between the OpenRiskNet Consortium members and other organisations within the scientific community. Any organisation such as a university, institute, consortium, non-governmental organisations (NGOs), as well as small and medium enterprises (SMEs) or large commercial companies can become an Associate Partner of OpenRiskNet.

Information on **how to become an Associated Partner to OpenRiskNet** will be available soon.

Project Partners

Douglas Connect GmbH, Switzerland (Coordinator)
Johannes Gutenberg-Universität Mainz, Germany
Fundacio Centre De Regulacio Genomica, Spain
Universiteit Maastricht, Netherlands
The University Of Birmingham, United Kingdom
National Technical University Of Athens, Greece
Fraunhofer Gesellschaft Zur Foerderung Der Angewandten Forschung E.V., Germany
Uppsala Universitet, Sweden
Medizinische Universität Innsbruck, Austria
Informatics Matters Limited, United Kingdom
Institut National De L'environnement Et Des Risques, France

Contact

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E-mail: thomas.exner@douglasconnect.com

Web: www.openrisknet.org (under construction)





INTRODUCING TANIA



TANIA – TreAting contamination through NanoremediAtion

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Ilaria Corsi — ilaria.corsi@unisi.it University of Siena Marine Ecotox Focus Group

“Nanoremediation” arrived in the INTERREG EUROPE programme thanks to the TANIA project, funded under the 2nd call 2016 (www.interregeurope.eu - Priority axis 4: Environment and Resource Efficiency) and led by Tuscany Region (Italy).

The kick-off took place in February 2017. Green nanotechnology refers to the use of NMP to enhance the environmental sustainability of processes producing negative externalities and to the use of nano-products to enhance sustainability. Green nanotechnology has two goals: producing nanomaterials and products without harming the environment or human health, and producing nano-products that provide solutions to environmental problems.

The concept of Nanoremediation fits into this second objective. Environmental remediation deals with the removal of pollution or contaminants from environmental media such as soil, groundwater, sediment or surface water. Nanotechnology has exciting potential for the protection of natural heritage, in terms of treatment of contaminated soils and water. Nanoremediation can be used for pollution prevention, remediation, disinfection, purification of water and wastewater treatment, specifically: clean-up of past pollution, improvement of current treatments and prevention of future contamination. Nanoremediation is a highly innovative, low cost technology that can be used as an alternative to current in-situ methods. Nanoremediation uses secure technologies, with minimal risks associated with their production and their use.

However, there are challenges. The technology is currently not widely diffused despite an ever-increasing number of sites requiring swift treatment to combat contamination. Being so innovative, there is still resistance to their large-scale application and to policies that support it. There is a lack of information and knowledge on their safety and potential, leading to much misinformation. Therefore, in order to further promote the application of Nanoremediation techniques and technologies, regional policy makers must work together and with main stakeholders in order to:

- Support continued research and innovation into the identification and production of eco-compatible and eco-sustainable nano-technologies for treatment of contaminated soil and water;
- Define a standardized methodology to evaluate the effectiveness, economic sustainability and the environmental safety and impact of NM and NP for contamination treatment, within the context of existing environmental regulations at National and European level.
- Develop a policy framework to provide incentives for in-situ use of NM and NP for treatment of contaminated soil and water;
- Raise awareness on the process of Nanoremediation, its benefits and means of application.

In this context, through an interregional exchange of practices and working initiatives, TANIA aims to improve the policy instruments of the participant EU regions in order to raise awareness and support the application of advanced (nano) materials for environmental remediation. Particularly TANIA addresses the challenge of eco-compatible and eco-sustainable procedures for environmental treatments by supporting a wide and effective application of nanoremediation for contaminated soil and water.

The project will be developed by a partnership of 8 members coming from 5 EU regions including 4 managing authority of the policy instruments to be improved:

1. Agenzia per lo Sviluppo Empolese Valdelsa (coordinator) and Tuscany Regional Council (Italy)
2. Regional Council of Alsace Champagne-Ardenne Lorraine and University of Lorraine (France)
3. Regional Council of Päijät-Häme and University of Helsinki (Finland)
4. Region of Crete (Greece)
5. Government of Baranya County (Hungary)



THE FOSTER PROJECT – NAVIGATING THROUGH OPEN SCIENCE

In a sea of publisher and funder mandates, policies and embargoes on Open Science (OS), it may feel easier to set the right course than actually staying true to it every day. Committing the NanoSafety Cluster community to the benefits of OS might also at times feel the right, even if daunting, choice. But if putting OS to action raises apprehension, the NSC community does not have to start from scratch.

The [FOSTER Project](#) (Feb 2014-Jul 2016) and FOSTER+ follow up (May 2017-May 2019), aim to facilitate implementation of [EC's Open Science agenda](#). At grass-roots level, the partnership is focused on [training](#) the entire [academic ecosystem](#), and may offer the basic elements to give the NanoSafety Cluster community a running start on OS.

Although OS itself is still looking to establish its own vocabulary, a taxonomy (Figure 1) provides a visual map of the terms in circulation. OS novices can quickly evaluate how much more open their own [research lifecycle](#) could really be. Another [version of the taxonomy](#) highlights the terms with the most learning materials available and defines the gaps.

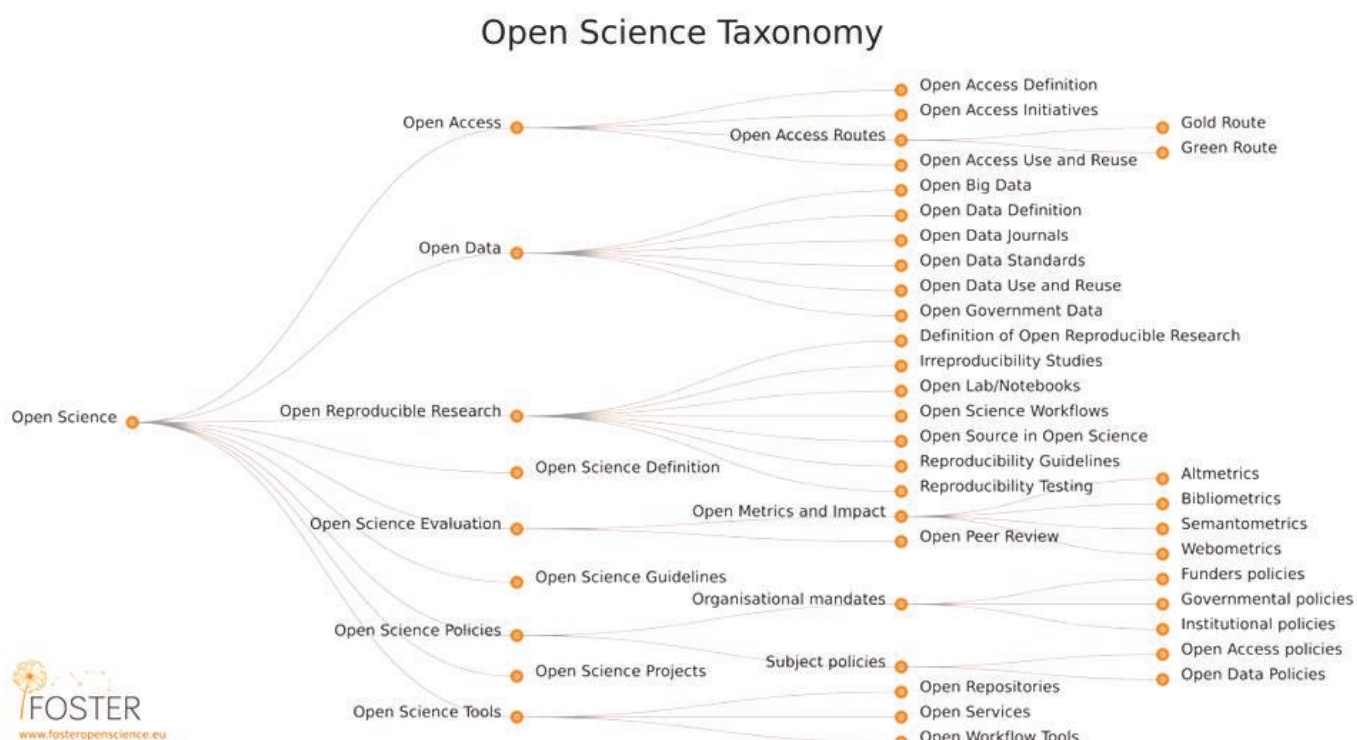


Figure 1: Open Science taxonomy (Pontika et al., 2015 <http://oro.open.ac.uk/44719/>)

Our collective knowledge of [useful resources](#) is organised according to OS terms and matches the research workflow: [Research Data Management](#) (RDM), [Open Data](#), [Open Science Tools](#), and [Open Access](#), etc. The RDM is particularly relevant for the H2020 Open Data mandate introduced in Jan 2017.

Based in a backbone of [Learning Objectives](#) the FOSTER+ Portal offers a selection of [self-learning e-courses](#). Each e-course takes 2-4 hours covering topics like: Introduction to OS, Open Data for Horizon2020, Responsible Research and Innovation and OS skills. Moderated versions of the e-courses will again be offered later in 2017 and announced on the [Events Calendar](#). Some of our courses have been translated in Spanish and Polish. FOSTER+ welcomes community contributions on the translation, as well as the [creation of new courses](#).

Last but not least, the [Speakers Directory](#) points to individual trainer's expertise and disciplinary strengths, should personal engagement and customised training be the desirable delivery method.

On behalf of FOSTER+ partnership, we invite the NanoSafety Cluster community to give us critical feedback on these OS resources by emailing us at learning@fosteropenscience.eu and work with us to develop new ones in areas of priority for the network.



NANoREG LEGACY PUBLICLY AVAILABLE

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Ministry of Infrastructure and the Environment
Project Manager NANoREG
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After four years of collaboration between over 80 partners, the FP7 NANoREG project ended on 28 February 2017. The project was aimed at developing reliable, reproducible and relevant methods for testing and assessing the effects of nanomaterials in a regulatory context. The project has resulted in a great number of scientific as well as policy and regulatory-oriented deliverables, about 60 SOPs with a status ranging from “proof of concept” to “validated”, and a huge set of well-defined experimental data.

Results of the project have been integrated in the NANoREG framework for the Safety Assessment of Nanomaterials. It provides a detailed overview of how the safety of NMs can be assessed in the context of the European REACH Regulation. It also proposes forward-looking strategies aiming at making the nanomaterial safety assessment in the REACH context more practical and economically efficient. The NANoREG Toolbox supports the implementation of the Framework by listing methods, datasets, models, guidance documents, decision trees, etc., from within and beyond NANoREG.

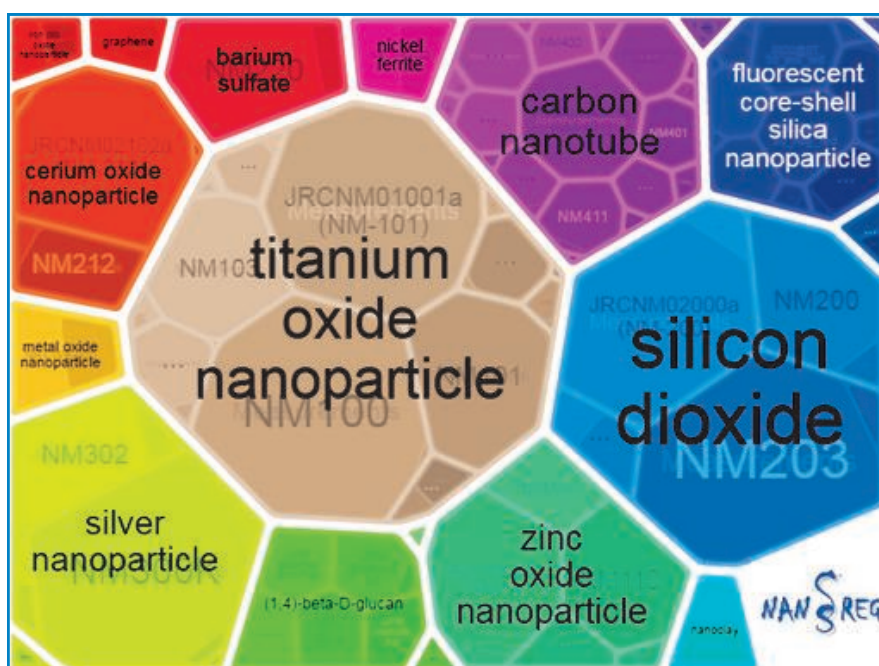
As probably one of the first nanosafety projects, all results of the project, deliverables, SOPs, and data, will be publicly available directly after the end of the project. This has been made possible by the willingness of NANoREG partners to conclude an addendum to the Consortium Agreement that formalises the opening up of NANoREG foreground and defines the conditions for access to the data. More specific, the results will be available under the [Commons Attribution-NonCommercial-ShareAlike 4.0 International License](#). Commercial use of data and information is possible but needs an agreement with the owner(s) of the data and information.

The opening up of the NANoREG Legacy fits in – and expresses - the growing awareness in the nanosafety community that collaboration and sharing of information is the only way to make real progress in nanosafety research.

All the NANoREG results will be stored in the “NANoREG Results Repository” that will be operational as of midst March. The results will be accessible via the NANoREG web site and via links in the NANoREG Final report that will be published in April this year. The NANoREG experimental data are stored in the [NANoREG eNanoMapper instance](#) that also will be accessible as of 15 March 2017. Other projects like NanoReg2 and CaLIBRATE already indicated that they will build on those results by using the data for further analysis and for modelling.

The NANoREG results will feed into the ProSafe White Paper that will provide recommendations for regulators and policy makers with respect to the risk assessment of nanomaterials for the short and long term. A draft of the White Paper will become available for consultation in March.

For further information contact the [NANoREG Project Office](#)





NANOMILE - VITROCELL® AUTOMATED EXPOSURE STATION

Sonja Mülhopt and Tobias Krebs, Karlsruhe Institute of Technology
Vitrocell Systems GmbH: muelhopt@kit.edu; info@vitrocell.com

Within the NanoMILE project the VITROCELL® Automated Exposure Station has been specifically designed and engineered to facilitate the research of the direct exposure of human cell cultures to airborne substances such as gases, complex mixtures, nanoparticles and fibers at the air/liquid interface by KIT and VITROCELL Systems. The system authentically simulates the conditions of human physiological exposure. It offers a capacity of up to 18-cell culture compartments for exposure and 6 compartments for clean air control. All key functions for successful exposure such as, aerosol flow rates, humidity, temperature and leak test are edited by touch-screen prior to the experiment. The respective data is shown on live graphs and stored for further analysis. The cells are exposed at the air/liquid interface on 6/12/24-well sized cell culture inserts. The isokinetic sampling system enables a uniform delivery of the test substance to the cells. High voltage charging increases deposition efficiency.

A detailed description of system together with characterization data and the application at different combustion sources are recently published by Mülhopt et al. in the Journal of Aerosol Science. For further information regarding the now commercially available VITROCELL® Automated Exposure Station please visit www.vitrocell.com.

Mülhopt, S.; Dilger, M.; Diabate, S.; Schlager, C.; Krebs, T.; Zimmermann, R.; Buters, J.; Oeder, S.; Wäscher, T.; Weiss, C.; Paur, H.-R. (2016) *Toxicity testing of combustion aerosols at the air-liquid interface with a self-contained and easy-to-use exposure system*. Journal of Aerosol Science, 96, 38-55. doi:10.1016/j.jaerosci.2016.02.005
<http://www.sciencedirect.com/science/article/pii/S0021850216300647>

For more information about the NanoMILE project: <http://nanomile.eu-vri.eu/>



Figure 1: VITROCELL® Automated Exposure Station for reproducible exposure of bioassays at the air-liquid interface

Image credit: photograph copyright by VITROCELL Systems GmbH

caLIBRAte LAUNCHES RISK ASSESSMENT SURVEY FOR NOVEL TOOLS

<http://nanocalibrate.eu/>

Sean Kelly, Nanotechnology Industries Association
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Are stakeholders aware of state-of-the-art tools and models for risk governance of nanomaterials and nano-related products?
What are the experiences, needs and priorities for decision-making, risk appraisal and risk transfer?
Are existing approaches to risk governance practical and effective?

These are just some of the questions that the caLIBRAte project will seek to answer in its recently launched survey about the assessment and management of potential risks of engineered nanomaterials and nano-enabled products.

All stakeholders from research, industry, insurance, regulation and policy, workers and consumers' organizations from around the world are invited to participate in the survey. This will help caLIBRAte develop an up-to-date, user-friendly and reliable system which integrates existing and new models and tools for risk governance of nanomaterials.

Participating in the survey and engaging with the caLIBRAte project will help you by:

- Shaping future risk governance systems for nanomaterials, based on your views and needs
- Receiving the survey results and connecting you with other outcomes from calibrate
- Giving you priority access to state of the art knowledge and data about risk-governance of nanomaterials and nano-enabled products

This first questionnaire will explore needs, priorities, views and capacities of stakeholders. Participants will also be invited to take part in a future 2nd stage questionnaire. Compilation of the survey will take no more than 20 minutes. Researchers, business people, insurers, regulators, policy makers, risk managers, end-users, CSOs, NGOs, workers and consumer representatives with an interest in with nanomaterials and related products, are invited to take part in the survey at: http://survey.risk-technologies.com/Survey_Run.aspx?ID=766



NANOFASE NEWSLETTER 1 – ON THE WAY TO EXPOSURE BREAKTHROUGHS

The NanoFASE project's first [Newsletter](#) is now available for download! We invite you to read about our first year of work, meet our Young NanoScientists, and note the dates of workshops where you can share our learning.

NanoFASE is preparing Fate and Exposure models for you, to bring Environmental Exposure Assessment for Engineered Nanomaterials to the highest standard.

The link: http://nanofase.eu/getatt.php?filename=oo_872.pdf.



BIONANONET NEWSLETTER – AVAILABLE TO DOWNLOAD NOW



Please follow the link https://www.bionanonet.at/images/BioNanoNet_News_2017_01.pdf to download our recently published BioNanoNet Newsletter!

Besides contributions from our BioNanoNet members, reports about projects and activities and an overview of interesting events, we kindly highlight the BioNanoNet member presentations within this newsletter, which present:

- Payer Medical GmbH
- Institute of Paper, Pulp and Fibre Technology at Graz University of Technology





SUCCESSFUL spICP-MS DATA ANALYSIS WORKSHOP

Anna K Undas

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Single particle inductively coupled plasma mass spectrometry (spICP-MS) is becoming a major tool in the detection and characterization of engineered nanoparticles. From 10-12 January 2017, three NanoSafety Cluster projects decided to group together to offer a hands-on and theoretical training workshop initiating a new generation of scientists to the use of this technique.

The spICP-MS data analysis workshop took place at RIKILT Wageningen University & Research (Wageningen, The Netherlands), 10-12 January 2017.

The workshop was organized by three European projects: NanoFASE, Innanopart, and NanoDefine. The theoretical and lab components of the workshop were designed for PhDs and researchers from academia, industry and measurement institutes experienced or interested in the nano characterization field.

Fifty-five participants from 14 European countries linked to more than 10 European and/or national nano-related projects participated.

The agenda included presentations and hands-on trainings (computer and laboratory exercises).



On Day 1, Dr. Chady Stephan (PE, Canada), and Dr. Geert Cornelis (Swedish University of Agricultural Sciences) explained theoretical background and fundamental aspects of the spICP-MS technique. Then, Dr. Olga Borovinskaya (TOFwerk), Dr. Meike van der Zande (RIKILT, Wageningen University & Research) and Dr. Andreas Gondikas (University of Gothenburg) introduced listeners to the applications of spICP-MS technique in multi-element analysis, toxicology and environmental studies. The long day was closed by a festive dinner in the one of the local restaurants.

On Day 2 two approaches for spICP-MS data analysis were introduced and discussed: the Excel-based “Single Particle Calculation Tool” authored by Dr. R. Peters, and NanoCount 3.0 software developed by G. Cornelis. This was followed by computer exercises, where every participant had an opportunity to analyse the data. On the final day, a reduced group (due to laboratory safety limitations) of 15 selected participants benefitted from hands-on training for sample preparation and measurement in the laboratory.

Lecturer Geert Cornelis observed that “working with actual data in computer classes was the tipping point for many, where they started to see it was not so difficult after all.” Moreover this large-scale user test allowed a couple of software features to be corrected/improved, and the new NanoCount 3.0 software has been shared.

Guest presenter Chady Stephan, senior lead for inorganic applications at Perkin Elmer Canada, judged this “a well attended, well organized workshop with outstanding scientific program”.

Participant evaluations are being collected to guide future hands-on workshops for the Cluster and beyond.

For more information on NanoFASE, Innanopart, NanoDefine

<http://nanofase.eu/>

<http://www.nanodefine.eu/>

<http://empir.npl.co.uk/innanopart/>





NanoStreeM WORKSHOP REPORT

Nanomaterial Risk Assessments and communication of their findings

Dr. Dimiter Prodanov, PhD

EHS Life Science & NERF Partner

NanoStreeM

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Introduction

Understanding properties of engineered materials and how they affect biological systems, human health, and the environment is a relatively new area of scientific study which requires long term efforts. On the other hand, timelines of obtaining adequate scientific understanding greatly mismatch those of product innovation and market distribution. Addressing this concern, the NanoStreeM project focuses on identifying gaps in the current understanding of the occupational hazards related to the use of nanomaterials in the semiconductor industry.

On 10th Nov 2016 the NanoStreeM consortium organized a workshop entitled "Nanomaterial Risk Assessments and communication of their findings". The workshop was held as a satellite event at the NanoSafe 2016 conference. The event explored some of the findings of NanoStreeM in the nanomaterial trajectory investigation for a typical semiconductor FAB. The workshop gathered participants and speakers from the industry and the academia.

Summary of the contributions

Dimiter Prodanov (IMEC) gave an overview of the project goals and the strategy of the project. In particular he emphasized the diversity of the chemical products used in semiconductor industry in view of the CMOS scaling requirements and roadmap.

Pascal Roquet (ST) gave an overview of the investigated nanomaterial trajectories in a semiconductor fab giving examples by chemical mechanical planarization (CMP). The presentation concluded with the following statements:

- The list of nanomaterial trajectories related to tasks and operations within semiconductor facilities served as the basis to select candidate exposure scenarios for deeper consideration within the NanoStreeM consortium.
- CMP slurry is the well-established nanomaterials used within the semiconductor sector. The vast majority of nanomaterial trajectories listed in the inventory fall into this category.
- Nevertheless, a certain number of tasks with potential exposure to environment, including potential high exposure rating were identified. It confirms the need of further investigations and study within the NanoStreeM project.

Michel Masselot (ST) gave an overview of how the Nano risk related to CMP activity is handled in one of the largest manufacturing Fab of ST (Crolles / France). The presentation highlighted the general approach introduced in 2008 by cooperation with French authorities and expert groups (INERIS, CEA), including formal training of "Nano preventer", then using some measurement campaigns to include concrete elements within the risk analysis, and so contributed to confirm some hypothesis.

Lieve Geerts (VITO) gave an overview of the techniques of the environmental impact assessment. In particular she gave the example of the CMP slurry, which is identified as a class of nanomaterials with potential environmental impact and the ways to assess it.

Eric Zimmermann (CEA) gave an overview of the measurement techniques for nanomaterials with particular emphasis on air and water sampling studies.

Daniela Iacopino (Tyndall) gave an overview of the safety training available within the consortium and stressed that only 4 partners out of 14 had training specific to nanomaterials. The end users panorama was also found quite broad and in need of different information, ranging from researchers to management to safety officers. The online tools (training, videos, websites etc) available within the consortium were found to be even scarcer. This highlighted the need for development of more online tools within the consortium as well as the need to develop custom made safety training packages tailored to researchers, management and safety officer end users.



Samuel Butcher (Labster) gave an overview of the Labster online learning platform. The platform utilizes game-based learning strategy in order to improving learning of lab safety. At present there are 3 simulation environments, which can be potentially suitable for nanosafety.

Pasqualantonio Pingue (SNS) gave an overview of the NanoLab project running in Italy. The aim of the project is to develop novel tools for risk prevention and safety management of NMs in R&D laboratories, on the basis of a precautionary approach aiming to ensure a safe and successful development of NMs. Dr. Pingue emphasized the differences of the risk classification coming out from different Risk Assessment tools currently being in use or development.

General discussion

The workshop concluded with a general panel discussion, which can be summarized as follows:

- The external speakers and the audience found the approach followed by NanoStreeM as valuable. Specifically, the involvement of the industry and the applicability of the approach were appreciated.
- Advanced materials, such as graphene and other carbon materials can be approached from the same perspective as the engineered nanomaterials investigated by the NanoStreeM consortium
- The environmental release of nanomaterials can be a potential issue and more effort is needed in this direction
- Innovative interactive training platforms, such as Labster, can be considered for deployment of general semiconductor-related safety trainings.
- In particular, for nanosafety, because of the higher degree of learning necessary, this can be the best choice.

ABOUT THE NanoStreeM project

Engineered nanomaterials (ENMs) are currently used in hundreds of commercial products and industrial processes. To maximize the benefits of nanotechnology and avoid unwanted consequences, additional data are needed to better understand potential health risks and necessary control measures across the life cycle stages of novel nanoscale or nano functionalized materials.

By comparing various risk assessment approaches and sharing good practices, the European **NanoStreeM** project will contribute to the improvement of the awareness and safety of workers in the semiconductor industry, and to the minimisation of the impact on the environment. The goal of this project is to gain insight in the potential pathways of exposure to and release of nanomaterials, compile risk management practices enabling better risk governance, and dissemination of these results to the European semiconductor industry. Additional application of the combined risk assessment and gap analysis framework will also help to further refine the assessment approach for nanomaterials.





OECD-PROSAFE – JOINT SCIENTIFIC CONFERENCE

PROSAFE - Science based support for the regulation of manufactured nanomaterials

<http://www.h2020-prosafe.eu/>

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From November 29th to December 1st 2016, in Paris, a group of 180 international experts debated the regulatory relevance and applicability of science-based results generated over the past 10 years, regarding the Environmental, Health and Safety (EHS) aspects of nanomaterials. The conference was hosted by the OECD and funded by the EU H2020 project ProSafe coordinated by the Dutch Ministry of Infrastructure and the Environment. It also was the final conference of the European Union flagship project NANoREG.

The results of this scientific conference will form the basis for recommendations by the ProSafe project to policy makers, regulators and industry on how to test and assess the effects and risks of nanomaterials. It also will be input for international programmes for the harmonisation of test methods, such as that of the OECD.



The conference was organised around interlinked themes covering the exposures through the life cycle, fate, persistence and bioaccumulation, ecological effects and human health effects. Over 1000 peer reviewed publications and reports were reviewed and evaluated by a panel of experts, and the results were collected in a Joint Document. The Joint Document formed the basis for the conference, and it will be published soon as a series of papers in a special issue of the peer-reviewed journal NanoImpact.

As a general conclusion, experts found that for all nanosafety themes there is a need to continue to work towards the further harmonisation of tests methods in order to create a solid base for testing nanomaterials and to fulfil the conditions for mutual acceptance of data.

Experts reiterated that since testing and assessing the effects and risks of nanomaterials can be extremely complex, time consuming and hence costly, it is not feasible to investigate every nanoform of a substance by applying a full test battery. Therefore, a central role in the future nanosafety governance will be played by effective benchmarking methods, tiered testing schemes, grouping frameworks, and modelling approaches of which several promising examples have been discussed. These approaches, which are under development in several research projects, can contribute to a more cost efficient safety assessment of manufactured nanomaterials.

Scientists expressed the need for more specific guidance regarding the EHS data that should be generated to fulfil regulatory requirements. It was stressed that a sharing of experimental data is key to make real progress in developing models to predict the effects of nanomaterials: a basic condition for safe by design, grouping and read across. Structural provisions regarding data management are needed, like harmonised data logging, data curation and sustainable data storage. On this side, the European Commission is working to build a common data logging format, to be used by all actors, based on the eNanoMapper project.

The conference results will feed into a White Paper with short and long term recommendations regarding risk assessment of NMs for policy makers, to be released before the summer of 2017. A draft of this White Paper will be discussed during a ProSafe workshop with assessors and policy makers on 22 March 2017, and in a second workshop on innovation to be organised in April 2017.

For more information:

P. Kearns peter.kearns@oecd.org and T. van Teunenbroek tom.van.teunenbroek@minienm.nl



NANODEFINE: TWO NEW PUBLICATIONS

Electrospray Deposition System: new development for Electron Microscopy Sample preparations

Submitted by Iñaki Mugica, RAMEM
i.mugica@ioner.eu



The new perspectives and opportunities opened up by the use of NanoParticle (NP) require new tools to manipulate, characterize and work with them. In this regard, IONER has designed an instrument for the deposition of NP in surfaces within the framework of the NanoDefine project.

Electron Microscopy (EM) techniques are the most accepted techniques for NP size analysis. However, the used sample preparation systems nowadays are not problem free. NP dispersions are deposited in the EM grids and solvents are evaporated. But the evaporation of the solvent to leave the NPs dry in the grids may provokes agglomeration of the NPs, therefore the size analysis become challenging. Moreover the particles are not usually distributed homogenously on the grid. Automatic image treatment is impossible under these circumstances.

Electrospray Source (ES) is an instrument to generate ions and charged NP from a liquid phase sample. This instrument is quite versatile and well suited for a broad range of applications, including, but not limited to: basic aerosol research, nanoparticle production, fundamental electrospray research, DMA calibration, and source of biomolecules (DNA, proteins...) for MS.

In general, the sample is made up of a volatile organic solvent and analyte in dissolution or suspended colloidal particles. This sample which should have optimal properties (electrical conductivity, surface tension and viscosity) is injected through a capillary. Because of the electric field, a cone ("Taylor cone") is formed on the end of the capillary. A jet of liquid is emitted from the tip. The fluid breaks into droplets because of surface tension instabilities. The droplets get reduced in size because of the evaporation of the solvent, which makes the surface charge of the droplets increase. When the surface charge is too high compared to surface tension and viscosity, the droplet breaks (Coulombian explosion) in order to generate more surface and accommodate the charge. The repetition of this process generates smaller and smaller droplets and end when all the solvent is evaporated and only the solid residue is left.

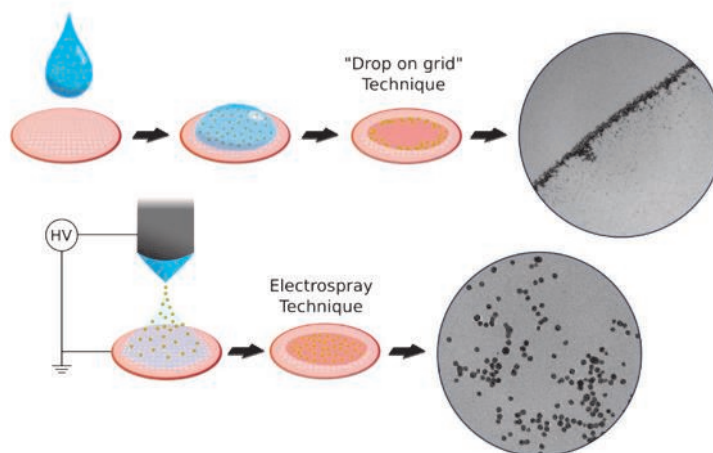


Figure 1: Simplification of "Drop on grid" and "Electrospray Deposition" techniques for Electron Microscopy grids preparation.

Having the NPs charged is a good way of avoiding the agglomeration due to coulombic repulsion between them. IONER has designed and developed an ElectroSpray Deposition system especially for sample preparation of NP dispersions for EM techniques.

The ES-Depo system is composed by a simplified electrospray chamber where the counter electrode is the collector supporting the grid.

By using conductive EM grids the charged NP are deposited on them minimizing the agglomeration due to the coulombic repulsion. Due to spraying, all grid surface is homogenously covered.

Publications

Mielke, J., Dohányosová, P., Müller, P., López-Vidal, S. and Hodoroaba, V.-D. (2017) 'Evaluation of Electrospray as a Sample Preparation Tool for Electron Microscopic Investigations: Toward Quantitative Evaluation of Nanoparticles', *Microscopy and Microanalysis*, pp. 1–10. doi: 10.1017/S1431927616012587.

Mielke, J., Dohányosová, P., López, S. and Hodoroaba, V.-D. (2016) 'Electrospray Deposition of Nanoparticles on TEM Grids', *Microscopy and Microanalysis*, 22(S3), pp. 1846–1847. doi: 10.1017/S1431927616010072.



The potential of the volume-specific surface area (VSSA) to classify nanomaterials and non-nanomaterials

A new paper has been published on the potential of the volume-specific surface area (VSSA) to classify nanomaterials and non-nanomaterials. Based on the use of highly characterized benchmark materials from the NanoDefine EU FP7 project, a tiered screening strategy for the purpose of implementing the definition of nanomaterials according to the EU recommendation has been derived and applied for the classification of representative industrial materials.



It is shown that VSSA could help to prevent false-negative classification, e.g. by electron microscopy. The study recommends to include the VSSA screening strategy in the technical guidance for the implementation of the EU definition.

The paper is open access available at:

<http://link.springer.com/article/10.1007/s11051-017-3741-x>.

More information available at: www.nanodefine.eu.



SERENADE – SAFER BY DESIGN

Safer and Ecodesign Research and Education Applied to Nanomaterial Development, the new generation of materials safer by design.

<http://www.labex-serenade.fr>

Jean-Yves Bottero, Labex SERENADE

bottero@cerege.fr

SERENADE is a French project which aims to develop and apply the “safer by design” process to create safer nano-products. It achieves this goal by combining knowledge and scientific approaches from a range of disciplines towards this common goal. This tutorial review presents the conceptual approach to “Safer by Design” and provides several examples of case studies primarily for TiO₂ (anatase) present in paints and cements to demonstrate how the approach can inform design decisions. Particular attention is paid to chronic low dose exposure scenarios.

This article is devoted to some new data concerning the life cycle of nano-products in relation to the synthesis of safer by design products as paints containing TiO₂. The end of life and exposure of cements and paints containing anatase and also the impact of nanoparticles on the WWTP have been studied. The effects on plants have also been evaluated for CeO₂ at low concentrations.

The data have been obtained with low concentrations of nanoparticles and after a relatively long time. Some new data concerning health risks (autophagy, ingestion of TiO₂ as a food additive, reprotoxicity) have been developed.

This paper is a review of the research studies on the first three years of an 8 year project. The conclusion shows the evolution of the research studies which are developed in the frame of case studies.

Article in Environmental Science: Nano, 2017, Advance Article, DOI: 10.1039/C6EN00282J

Web Link: <http://pubs.rsc.org/en/content/articlelanding/2017/en/c6en00282j>

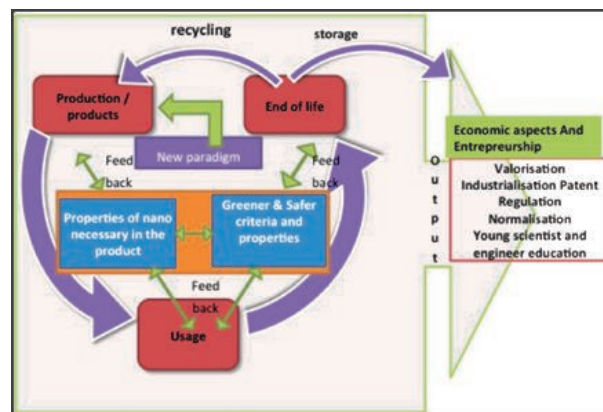


Figure 1: The different stages of the safer by design process including consideration of the product's risks and benefits across the value chain.

Image Credit: Labex Serenade



NANOTOES, QUALITYNANO, PANDORA PRODUCE JOINT PUBLICATION

Assessing the Immunosafety of Engineered Nanoparticles with a Novel *in Vitro* Model Based on Human Primary Monocytes

Yang Li, Paola Italiani, Eudald Casals, Dirk Valkenburg, Inge Mertens, Geert Baggerman, Inge Nelissen, Víctor F. Puentes, Diana Boraschi

Institute of Protein Biochemistry, National Research Council of Italy
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The possibility that nanomaterials could perturb the normal course of an inflammatory response is a key issue when assessing nanoimmunosafety. The alteration of the normal progress of an inflammatory response may have pathological consequences, since inflammation is a major defensive mechanism and its efficiency maintains the body's health.

The immunosafety of engineered nanoparticles at nontoxic concentrations was investigated with the use of a human primary monocyte-based *in vitro* system, which reproduces in a simplified fashion the full course of the physiological inflammatory response, from initiation and development to resolution. The kinetics of expression and production of inflammatory and anti-inflammatory cytokines and the proteomic profiles were used for describing the inflammatory defensive response.

We assessed the ability of gold and silver nanoparticles to trigger inflammation and to interfere with the course of an ongoing defensive reaction. While neither nanoparticle type was able to directly activate monocytes, silver nanoparticles could exacerbate the inflammatory response of monocytes but did not interfere with the resolution of the inflammatory reaction.

These findings support the use of human primary monocyte-based *in vitro* assays for realistically investigating the effects of engineered nanoparticles on human innate immune responses, in order to predict the immunological risk of nanomaterials and implement safe nanoparticle-based applications.

Web Link: <http://pubs.acs.org/doi/abs/10.1021/acsami.6b06278>



<http://nanotoes.sbg.ac.at>;



<http://www.qualitynano.eu>;



<http://www.pandora-h2020.eu/>



SMARTNANOTOX PUBLICATIONS

The SMARTNano Project has recently published the following publications:



Vogel U, Jacobsen NR, Knudsen KB, Poulsen SS, Bengtson S, Saber AT, Wallin H. Nanomaterial-induced genotoxicity in mice. EEMGS Annual Meeting; 2016 Aug 14-18; University of Copenhagen, Denmark. 40. 2016.

Vogel U, Poulsen SS, Saber AT, Jacobsen NR, Yauk C, Wallin H, Halappanavar S. Global gene expression profiling in nanosafety - for hazard identification, grouping and ranking and risk assessment. 8th International Nanotoxicology Congress. NanoTox 2016; 2016 Jun 1-4; Boston, USA. 409. 2016.

Schneemilch M., Quirke N. Free energy of adsorption of supported lipid bilayers from Molecular Dynamics simulation. Chemical Physics Letters; 664; 199-204. 2016.



INSTITUT DE BIOLOGIE MOLECULAIRE ET CELLULAIRE (IBMC)

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15 rue René Descartes 67084 Strasbourg Cedex, France
Phone 0033 3 88 41 70 88; Fax 0033 3 88 61 06 80
E-mail : a.bianco@ibmc-cnrs.unistra.fr



A Post-doctoral position is available at UPR3572 ICT, in Strasbourg, France. The candidate will be enrolled in a highly interdisciplinary project in the framework of the FET Graphene Flagship.

See: <http://www-ibmc.u-strasbg.fr/ict/article82.html?lang=en>

One of the objectives of the Flagship Work package 4 entitled “Health and Environment” is to study the impact of graphene related materials on the immune cells using in vivo models. This approach will provide information on the immune system and inflammatory responses, i.e. the body first lines of defence.

Eligibility

The position is open to candidates from any country, as long as they fulfill the following requirements: Expected candidates should have less than 5 years of research experience after the PhD or equivalent degree.

Required experience/skills

The candidate should hold a PhD degree, or equivalent research experience, in biology, toxicology or pathology. Additional expertise on nanomaterials or nanoparticles will be beneficial. He/she should have experience with animal work. In vivo impact of graphene related materials will be evaluated following injection looking to different parameters including key blood biological parameters and biodistribution and elimination of injected materials. Competences on tissue histology are mandatory to identify and analyze the organs primarily affected by graphene related materials following in vivo administration. The candidate should also have experience with cell culture and flow cytometry analysis. The candidate must be an independent mature person who is well-organized, and have an eye for details. He/she should possess good interpersonal skills and capacity to supervise undergraduate students. He/she should manage his/her own research and administrative activities, coordinate different aspects of the work to meet deadlines. He/she should contribute with ideas for new research projects, carry out comprehensive and systematic literature reviews and compile the results for publication in peer-reviewed journals, present papers and posters. He/she should carry out collaborative projects with colleagues in partner institutions, and actively participate in journal club and lab meetings.

How to Apply

Interested applicants should send the application including a cover letter, curriculum vitae and contact information of three referees to: Dr. Alberto Bianco (a.bianco@ibmc-cnrs.unistra.fr) by the 15th of April 2017. The starting date for the contract is May 2017.

Job details

Type of contract: Temporary (1 year renewable)

Status: Full-time

Company/Institute: CNRS Country: France

Address: UPR3572 ICT, IBMC, 15 Rue René Descartes, 67084 Strasbourg





POST-DOC BIOCOLLOIDS AND SURFACES AT MCGILL

www.biocolloid.mcgill.ca

Nathalie Tufenkji, McGill University

nathalie.tufenkji@mcgill.ca



The Biocolloids and Surfaces Laboratory at McGill University has an immediate opening for an exceptional post-doctoral scholar in the field of nanotechnology. The position will be held in the Department of Chemical Engineering. We seek a candidate with expertise in one or more of the following areas:

- (1) physical chemistry;
- (2) aquatic/colloid chemistry;
- (3) materials science/engineering.

The selected candidate will join a dynamic and diverse research team and use novel techniques to design and validate nanocomposites for a broad range of environmental and commercial applications. This project is funded through NSERC and the Canada Research Chairs program and may have a duration of up to 2 years contingent upon satisfactory performance and continued funding. Salary will be competitive and commensurate with qualifications.

To apply for the position, please send a cover letter, academic resume, and list of 3 references to Prof. Nathalie Tufenkji (nathalie.tufenkji@mcgill.ca).

Review of applications will begin immediately



18-MONTH POST-DOC ASSOCIATION POSITION – LABEX SERENADE, FRANCE



The LabEx SERENADE (Laboratory of Excellence) proposes an integrated scientific and educational approach to develop new concepts and tools for the Safer and Ecological Design in nano-manufacturing processes and products.

SERENADE is seeking a post-doctoral researcher with computer modelling and web tool development experience to work on a nanomaterials database in the context of environmental engineering/environmental science.

The objectives of the Serenade database are to develop an integrated database and associated visualization tools. It will allow the SERENADE consortium to visualize and analyse their own data but also to integrate them with other datasets. The role of multiple parameters in predicting nanomaterial behaviour in different systems would be investigated as well as the potential risks with nanomaterials on the environment, human health or the end of life of nanoproducts. The development on the database will sidetrack the work and the structure of the CEINT (Center for the Environmental Implications of Nanotechnology at Duke University) database, designed for the comprehensive collection, management and analysis of integrated data across the CEINT center, literature and partner datasets. Moreover, by design, the database will be fully integrable and interoperable with other European related databases such as the eNanomapper European database.

We offer a 18 months post-doctoral position in order to implement the SERENADE database and to collaborate with the CEINT's group and other European database projects. This position offers the opportunity for international collaboration and global visibility within the nanoinformatics field.

The ideal candidate should have a PhD with an interdisciplinary data science background and research experience in the following areas: Web application programming skills, programming in Matlab and C++/Fortran, relational database design and associated skills in importing and manipulating large data sets from a variety of formats, and advanced Excel skills. Experience with modelling or analysis of nanomaterial, chemical and/or environmental study datasets is especially welcome, as are skillsets in numerical modelling, probabilistic modelling, and design and utilization of Bayesian Networks.

Please send CV, statement of research interests and the names and addresses of three references to:

Jérôme Rose, rose@cerege.fr or Camille de Garidel, cgaridel@cerege.fr



LIPOSOME EVALUATION FELLOWSHIP - CDER U.S. Food and Drug Administration (FDA)

Reference Code: FDA-CDER-2016-0174



How To Apply:

A complete application consists of:

- An application
- Transcripts – [Click here for detailed information about acceptable transcripts](#)
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional references

All documents must be in English or include an official English translation.

If you have questions, send an email to Anil.Patri@fda.hhs.gov or FDArpp@orau.org. Please include the reference code for this opportunity in your email.

Academic Levels: Postdoctoral

Description:

A postdoctoral research opportunity is currently available in the Office of Generic Drugs/Office of Research and Standards at the Center for Drug Evaluation and Research (CDER) of the U.S. Food and Drug Administration (FDA) to pursue characterization of various physico-chemical attributes and biological effects of liposomal and nanomaterial formulations.

This project provides ORISE fellows for FDA's generic drugs program to collaborate with other investigators (in and out of FDA) in addressing the 5 GDUFA research areas. The objectives of the projects are to produce review policy recommendations and advice in guidance for industry in using new scientific approaches to either make generic products available or to improve the quality and consistency of approved generic products. The five FY2017 topic areas are: 1) Post-market Evaluation of Generic Drugs 2) Equivalence of Complex Products 3) Equivalence of Locally Acting Products 4) Therapeutic Equivalence Evaluation and Standards 5) Computational and Analytical Tools.

The participant will have the opportunity to analyze data from external research studies to develop recommendations for complex generic products and ensure generic substitution; conduct analysis of internal FDA data to help develop equivalence standards for complex generic products and evaluate post-market data; conduct laboratory research to characterize complex reference products and evaluate approved generic products; and build databases and quantitative physiological and mechanistic models to support new approaches to bioequivalence.

This program, administered by ORAU through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education, was established through an interagency agreement between DOE and FDA. The initial appointment is for one year, but may be renewed upon recommendation of FDA contingent on the availability of funds. The participant will receive a monthly stipend commensurate with educational level and experience. Proof of health insurance is required for participation in this program. The appointment is full-time at FDA in the Jefferson, AR area. Participants do not become employees of FDA, DOE or the program administrator, and there are no employment-related benefits.

Qualifications:

Applicants must have received a doctoral degree in material science, nanotechnology, chemistry, cancer models, toxicology, pharmacology, biochemistry or biology within five years of the desired starting date, or completion of all requirements for the degree should be expected prior to the start date. Knowledge in advanced nanomaterial characterization tools, methods, and in vitro or in vivo studies desired. Prior experience with liposomes is highly desired.

Eligibility Requirements:

Degree: Currently pursuing a Doctoral degree or have received this degree within 60 months.

Discipline(s):

- Life Health and Medical Sciences (All)
- Other Physical Sciences
 - Chemistry (General)
- Nanotechnology (All)

Veteran Status: None



NANOSIZED PARTICLES—HEALTH EFFECTS

A researcher seeks partnership opportunities / cooperation on nanosized particles health effects.

Please see the following article about the testing of nanosized particles:

Colloidally stable surface-modified iron oxide nanoparticles: Preparation, characterization and anti-tumor activity. - Journal of Magnetism and Magnetic Materials. Volume 380 (2015) p. 125-131.

H. Mackova, D. Horak, G.V. Donchenko, V.I. Andriyaka, O.M. Palyvoda,
V.I. Chernishov, V.F. Chekhun, I.N. Todor, O.I. Kuzmenko

The improved and tested methods in this article on lipids, glutathione and blood proteins oxidation can be used as measurement tools to quantify the nanosized particles health effects.

The following links lead to articles as well as Citation Metrics (h-index, Hirsch index, number of citations) for publications.

Scopus:

<https://www.scopus.com/authid/detail.uri?authorId=7003998309>

GoogleScholar:

<https://scholar.google.com/citations?&user=x-bOR-oAAAAJ&sortby=pubdate&pagesize=100>

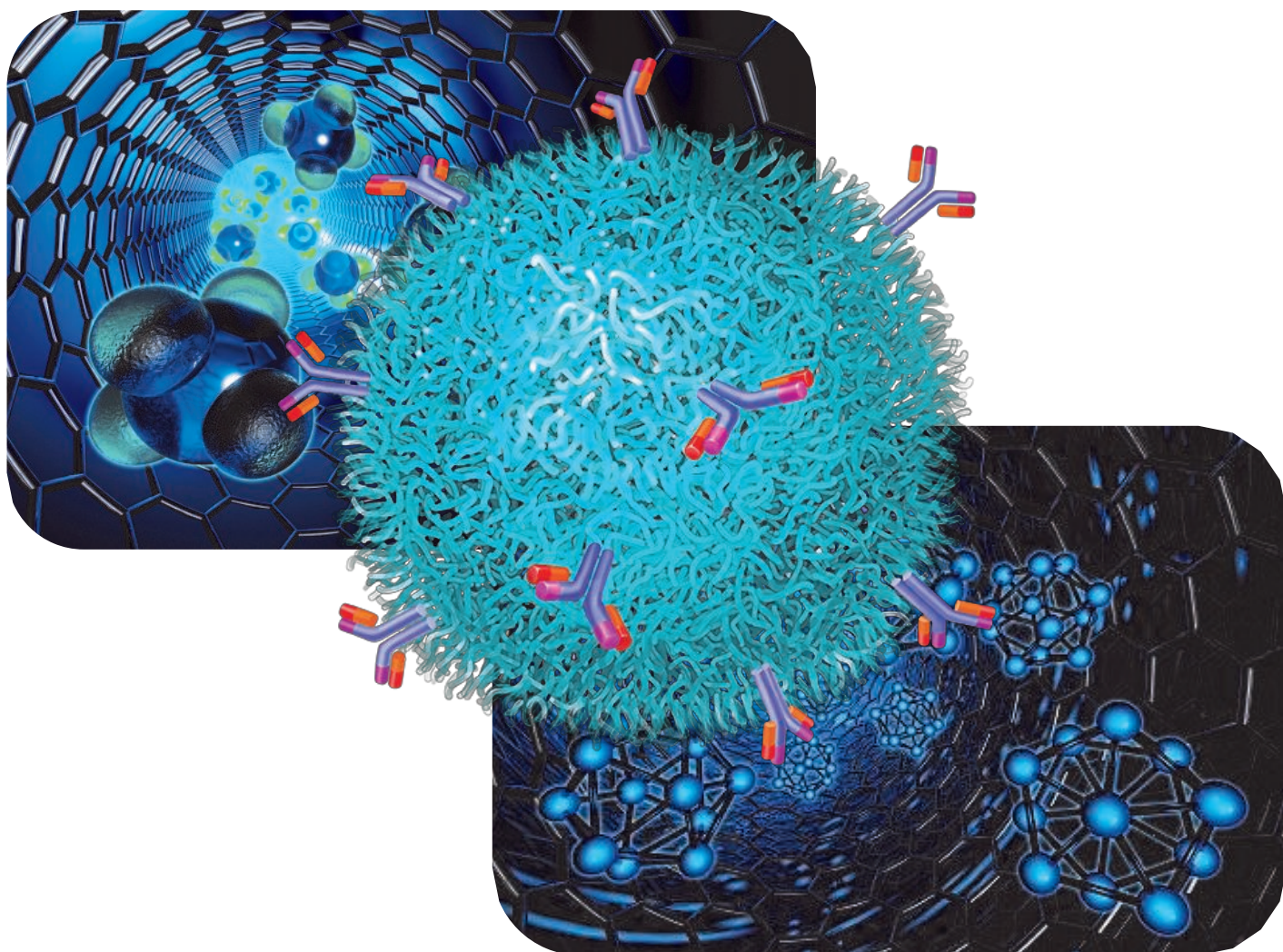
Please send expressions of interest to:

Oleksandr Kuzmenko, PhD

Palladin Institute of Biochemistry

National Academy of Sciences of Ukraine (NASU)

E-mail: akuzm@hotmail.com



NANOMATERIALS INDUSTRIAL WORKSHOP ON SAFE-BY-DESIGN

Sean Kelly
Nanotechnology Industries Association
sean.kelly@nanotechia.org

24-25 April 2017
GAIKER CENTRO TECNOLÓGICO- BILBAO, SPAIN

Organised by a number of Horizon 2020 projects, this workshop will introduce the safe-by-design concept and highlight some of the tools being developed to allow its use in industry. Industry are invited to attend to learn more about safe-by-design and how they can implement it.

Apply for registration at:
<https://www.bionanonet.at/component/chronoforms5/?chronoform=form2>

Organised by Prosafe, NanoReg2, caLIBRAte, NanoGenTools, EC4SafeNano, NanoMILE, NanoFASE

SWISS LIFE CYCLE ASSESSMENT DISCUSSION FORUM (DF LCA) 2017

Empa/Advancing Life Cycle Assessment Group
www.empa.ch/alca
Roland Hischier, Empa
roland.hischier@empa.ch
Swiss LCA Discussion Forum (DF LCA) 2017



How suitable is LCA for Nanotechnology Assessment?
Overview of current methodological pitfalls and potential solutions

May 24, 2017, Zurich (in English)

Ten years ago, participants to an international work-shop in Washington D.C. on “Nanotechnology and Life Cycle Assessment” concluded that, a priori, the LCA ISO framework is fully suitable for the assessment of nanomaterials and nanoproducts, despite notable shortcomings in the availability of inventory data and missing evaluation instruments for impact assessment. Since then, various actors have worked intensively on these issues with the goal of ensuring that traditional and nano-specific environmental issues can be assessed within a unified, comprehensive and consistent framework.

Based on the outcomes of different research projects, this forum will present currently used approaches in LCA of nanotechnology. The focus of the presentations will be on novel strategies for overcoming current issues related to nano-specific data availability and uncertainty (for the various steps of the LCA framework).

Important issues to be discussed at this one-day event include (inter alia) upscaling procedures (e.g. from lab to industrial production scale), modelling of nanoparticle releases into the environment, the quantification of health effects and the potential added value of combined LCA and risk assessment (RA) approaches.



NANOEH2017 CONFERENCE IN ELSINORE, DENMARK

Nadia Bolshakova, University College Dublin, Ireland
nadia.bolshakova@gmail.com

Join the NanOEh2017 Conference in Elsinore, Denmark May 29th – June 1st. The deadline for abstract submission has been extended to March 31, 2017. Please visit <http://nanoeh2017.dk>!



The NanOEh2017 Conference is approaching. Five keynote speakers present themselves and their keynote on the conference website so please visit <http://nanoeh2017.dk/scientific-program/keynote-speakers/>.

Building on the success of the 2015 symposium held at Legend Safari Lodge, Limpopo Province, South Africa, this conference will also bring together a multidisciplinary cross section of delegates from different scientific areas specializing in all aspects of nanosafety.

The theme of the conference is ‘Closing the gaps in nanosafety’, and the program will include keynote speakers, thematic sessions, oral sessions, and poster sessions. In addition there will be a special initiative for early career researchers including an Early Career Researcher Award.

The aim of the NanOEh Conference 2017 is to provide a platform for presentation of the current knowledge on nanosafety in the working environment as well as in the general environment and of the current state of the art for strategies for exposure assessment, hazard evaluation and risk assessment.

Session overview and abstracts

Here you also find the preliminary program and a session overview – many of them already with a session abstract and the names and titles of two invited speakers <http://nanoeh2017.dk/scientific-program/session-overview/>. Missing abstracts and invited speakers will be added.

The conference has 14 sessions with in total 48 open slots for oral presentations to be selected from the submitted abstracts. The organizing committee will evaluate the abstracts shortly after submission.

Please note that **deadline for abstract submission is extended to March 31, 2017**. If you aim for an oral presentation, please be sure to submit before the abstract deadline.

The deadline for Early Bird registration is 31st March 2017.

Spread the news

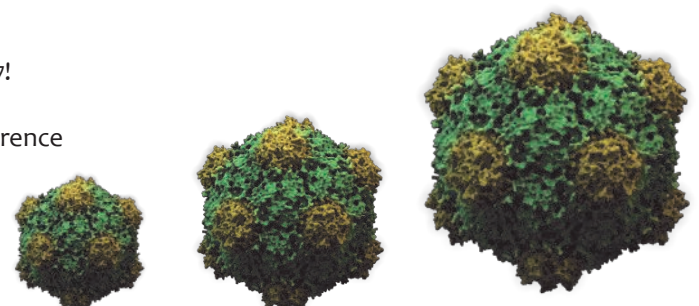
We need your help in making this conference a success. So please feel free to forward this mail and / or the attached flyer to your colleagues and professional network.

Please advertise the conference through your website, newsletter and social media.

Please don't hesitate to contact Kirsten Rydahl at nanoeh2017@nrcwe.dk should you need a conference logo for promotion of the conference.

We are looking forward to seeing you in Denmark 29th May 2017!

On behalf of the Scientific Committee of the NanOEh2017 Conference





SAFERNANO DESIGN SUMMER SCHOOL 2017

14-20 June 2017

ESI, Archamps Technopole (France), 15 mins. from Geneva.

Sylvia Lehmann

LabEx SERENADE, Université Grenoble-Alpes,

ESI-European Scientific Institute

sylvia.lehmann@univ-grenoble-alpes.fr



After a highly successful inaugural session in June 2016, the LabEx SERENADE, Université Grenoble-Alpes and the European Scientific Institute are co-organising the second edition of the SaferNanoDesign summer school.

Limited places

Applications via <http://www.safernanodesign.eu/> from 1st March to 30th April 2017

How can industrial innovation in nanotechnologies be reconciled with the legitimate concerns of citizens regarding environmental protection and public health? An intensive one-week specialist school, SaferNanoDesign familiarises postgraduate students and early-stage researchers with risk evaluation in a business context, using computational methods of modelling and simulation relevant to nanomaterials. Participants are exposed to the analytical tools and methodologies required to meet the challenge of the ecodesign of nanomaterial-enabled technology.

SaferNanoDesign uses a dynamic, three-tier approach, involving:

- Lectures and presentations,
- Practical sessions based on complex problem solving around a specific case study,
- Interdisciplinary group work on the development of an entrepreneurial innovation project.

The programme is delivered by international experts from leading universities, research centres, industry and regulatory bodies. The working language of the school is English.

At the end of SaferNanoDesign, students will have gained:

- An in-depth insight into the design of nanomaterials with specific and innovative industrial applications but which are safe for humans and the environment.
- Practical experience of exposure assessment and the development of predictive risk analysis based on modelling of the life cycle, from the production to the end of life, of nano enabled products in the environment. Theoretical and practical understanding of nanomaterial reactivity and transformation in the environment. Knowledge of the different types of assays available to assess the impact of nanomaterial exposure at different levels (environment, organism, cell, molecule ...).
- Knowledge of how to obtain and analyse “omics” data to perform gene ontology and pathway analysis.
- They will also become familiar with predictive toxicology via the adverse outcome pathways (AOP) and Effectopedia tool.
- An understanding of the challenges and opportunities of marketing nano-based products for an SME.
- An understanding of the process of translating an innovation project into an entrepreneurial venture.



Image Caption: Pictures of the summer school 2016

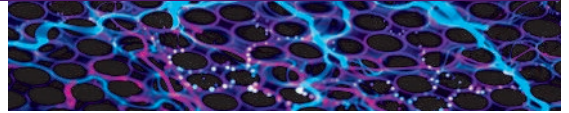
Image Credit: ESI and Labex Serenade

SOLUTIONS

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GROUPE

SECOND OPEN MEETING – EUROPEAN CONFERENCE ON STANDARDIZATION FOR NANOTECHNOLOGIES AND NANOMATERIALS, JUNE 20 IN MALTA

RELIABLE DATA FOR AN EFFECTIVE MANAGEMENT OF NANOMATERIALS



20 June 2017, Malta

<http://www.afnor.org/en/news/second-open-meeting-standardization-nanotechnologies-nanomaterials-june-20-malta/>

Patrice Conner, AFNOR
patrice.conner@afnor.org

CEN/TC 352 Nanotechnologies, for which AFNOR holds the secretariat, is arranging in collaboration with CEN CENELEC Management Centre (CCMC) and the European Commission (EC), a European Conference to present the progress of the voluntary standardization work in the field of nanotechnologies and nanomaterials and especially the work carried out by European Technical Committees CEN/TC 352 "Nanotechnologies", CEN/TC 195 "Air filters for general air cleaning", and CEN/TC 137 "Assessment of workplace exposure to chemical and biological agents".

Poster sessions on standards under preparation will allow a direct dialogue between participants and experts.

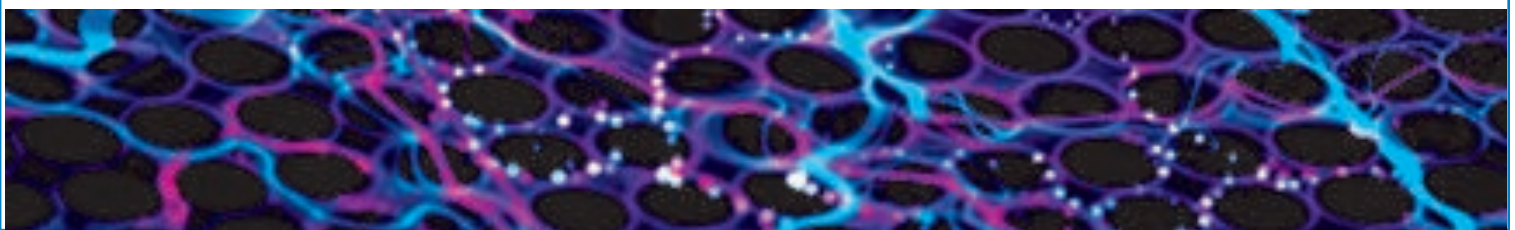
Various round tables will be organized with practitioners, industries, researchers and policy makers on e.g.:

- Topics of mutual interest like Nano-biotechnologies, Challenges in measuring and generating aerosol particle size and concentrations below 100 nm.
- Reliable data for an effective registration of nanomaterials including aspects on Toxicity, Ecotoxicity and the Environment'
- Requirements for data (curation) in nanomaterial databases and registries
- Methods to support the identification of nanomaterials (size, surface area, surface composition) with examples from NanoReg2, NanoDefine, NanoValid
- Methods for nanomaterial exposure and risk assessment. How to anticipate and address risks raised by nanotechnologies?
- How can Research projects impact Standardization activities? Main problems to link research projects with standardization projects

This conference is open to everyone who registers in advance, and participation is free of charge. The final programme and the web site are under finalization and should be ready soon.

For more information:

<http://www.afnor.org/en/news/second-open-meeting-standardization-nanotechnologies-nanomaterials-june-20-malta/>





THE NANODEFINE SUMMER SCHOOL— 21-23 June 2017

NanoDefine will organize a Summer School from 21-23 June, 2017 in Wageningen, The Netherlands.

The Summer School aims to provide training to internal and external (young and experienced) researchers on the tiered measurement approach and the NanoDefiner eTool developed by NanoDefine for the classification of nanomaterials.



After attending the Summer School, researchers will be able to appreciate the logic behind a tiered approach, to understand the fundamental aspects of the analytical methods presented, and to recognize the complexity of designing an analytical scheme and measurement strategy for the classification of a nanomaterial.

The concept of the European FP7 project NanoDefine is: Development of an integrated approach based on validated and standardized methods to support the implementation of the EC recommendation of the for a definition of nanomaterial. The major outcome of the project is the establishment of an integrated tiered approach based on validated rapid screening methods (tier 1) and validated confirmatory methods (tier 2). With the developed NanoDefiner eTool and user manual, end-users will be guided to implement the developed methodology.

SCOPE OF THE SUMMER SCHOOL

The Summer School will provide (i) training on the tiered approach and NanoDefine's eTool (developed by NanoDefine) for classification of nanomaterials, (ii) practical experience and use of the NanoDefiner eTool, from handling of raw data, such as EM pictures or sp-ICPMS output, to implementation into the NanoDefiner, and processing of sp-ICPMS data, (iii) practical training on sp-ICPMS and Electronic Microscopy (EM).

WHAT SHOULD BE EXPECTED FROM THE SUMMER SCHOOL

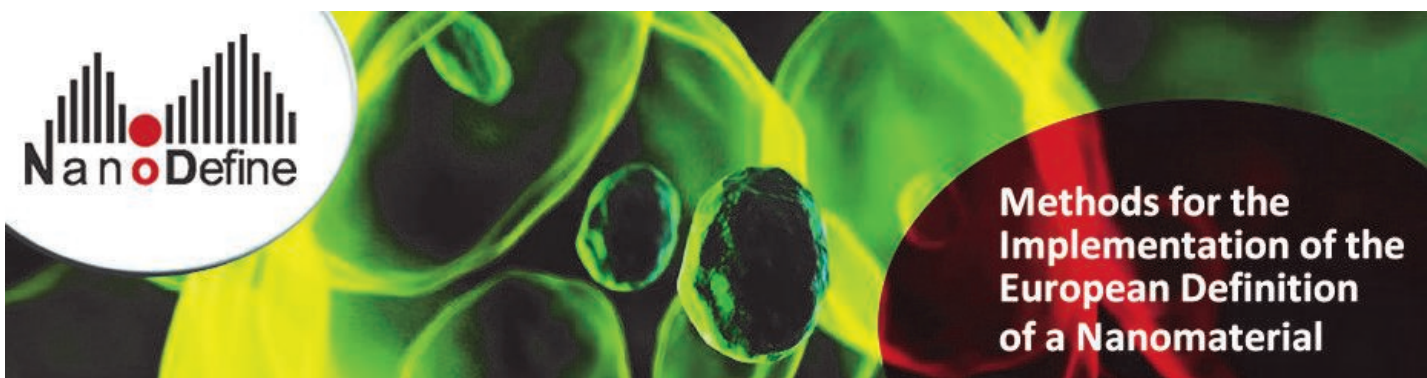
After attending the Summer School, participants will understand the concept of the NanoDefiner eTool, in connection with methods of analysis, such as spICPMS and Electron Microscopy, used.

WORKSHOP ORGANISER AND CONTACT INFORMATION

RIKILT Wageningen University & Research, P.O. Box 230, 6700 AE Wageningen, The Netherlands

REGISTRATION AND FEES

To register for the **Summer School**, please complete the **Registration Form** and email it to : wim.beek@wur.nl
Registration closes on **April 15, 2017**.



<h3>The NanoDefine Approach</h3> <ul style="list-style-type: none"> ▪ Sourcing and characterisation of real world test materials; ▪ Comparative evaluation of techniques; ▪ Development, validation, standardisation of key methods; ▪ Integrative e-tool for selection of techniques, evaluation of results, and classification according to the EU definition. 	<p>For citizens</p>	<p>For industry</p>	<h3>The NanoDefine Products</h3> <ul style="list-style-type: none"> ▪ The NanoDefiner e-tool; ▪ The NanoDefine Manual of Methods; ▪ Standard Operating Procedures (SOPs); ▪ Reference Materials; ▪ Prototypes of Instruments and Software; ▪ CEN/ISO Standards (work items); ▪ Technology Transfer to End-Users.
<p>For scientists</p>	<p>For policymakers</p>		



BRIDGE OVER TROUBLED WATER – NANOSCIENCE CONNECTING THE DISCIPLINES NANOFORUM FOR YOUNG SCIENTISTS—August 24-26 2017

University Medical Centre, Mainz, Germany

Abstract submission deadline: April 30, 2017;
Early bird registration deadline: May 31, 2017

Contact: danawestmeier@uni-mainz.de or docter@uni-mainz.de



Updated information concerning venue and scientific program can be found at: www.doctorslab.com

As nanoscience is clearly an interdisciplinary research area with no sharp boundaries, the nanoforum BRIDGE OVER TROUBLED WATER – NANOSCIENCE CONNECTING THE DISCIPLINES focuses on bringing together young scientists from different scientific areas like medicine, physics, chemistry, pharmacology and biology. The event is structured in interdisciplinary sessions opened by a top-class international research talk and followed by topic-relevant presentations of young scientists giving them the opportunity to present and discuss their data to a broad scientific audience.

Topics

- Shine bright like a diamond – NM characterization and engineering tools
- Ayo technology – Computational modelling and bioinformatics analysis
- Down to earth – Environmental fate and behaviour of NM
- Everytime we touch – NM microbe crosstalk
- Licence to live – NM for biomedical applications
- Eye of the tiger – Nanotechnology for detection and imaging

A brief abstract should be sent to danawestmeier@uni-mainz.de before April 30, 2017. The presentations will be selected by the scientific advisory board from the submitted abstracts. Selection will be performed double-blinded. Best abstract will be selected for short talks.

Registration fee 70 € includes:

- * Access to scientific program
- * Lunch and coffee breaks
- * Social dinner

There are several travel grants for young scientists available to cover accommodation, travel and registration fee. To apply for a grant, please send a cover letter attached to your abstract. The symposium will be supported by the Joachim Herz Foundation.

Organizing committee:

Dana Westmeier, Dominic Docter, Roland Stauber; University Medical Centre Mainz



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MAINZ

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HERZ
STIFTUNG





12th INTERNATIONAL CONFERENCE ON THE ENVIRONMENTAL EFFECTS OF NANOPARTICLES AND NANOMATERIALS (ICEENN 2017)

3-6th September 2017
Old Ikon Gallery, Birmingham, United Kingdom



Followed by:

EU-US CoRs meeting at University of Birmingham on 7th and 8th September 2017, NanoFASE-ACEnano stakeholder workshop on 7th September, and pre-and post-conference training events for young researchers

Abstract submission for nano2017 is now open for the 12 ICEENN conference which is returning to Birmingham this year.

The conference will be held at the iconic Old Ikon Gallery building, with satellite events such as the training schools and the EU-US Communities of Research event, held at the University of Birmingham's Edgbaston campus. The deadline for abstract submission for oral presentations is 15th May 2017.

Confirmed keynote speakers for nano2017 include:

- Chady Stephan, Perkin Elmer
- Serge Stoll, University of Geneva
- Antonia Praetorius, University of Vienna
- Susana Loueiro, University of Aveiro
- Heileen Hsu-Kim, Duke University
- Theodoros Karachalios, Nanothinx Ltd.
- Tae Hyun Yoon, Hanyang University
- Fred Klaessig, Pennsylvania Bio Nano Systems



Social space at the Old Ikon Gallery in Birmingham, venue for nano2017

A special issue of RSC journal Environmental Science: Nano (Impact factor 5.896) will be published showcasing key contributions from the conference.

Environmental Science: Nano are also sponsoring the "Best poster" prize for the conference (cash prize, e-subscription and certificate).

New for the 2017 event, the organising committee for ICEENN 2017 are seeking nominations for a "Rising star of Environmental Nanosciences" in remembrance of Prof. Steve Klaine.

As one of the founding fathers of environmental nanosciences, and the ICEENN conference series, Steve is sadly missed by all following his untimely death in 2016. To honour Steve's commitment to education and training of young scientists, we are seeking nominations for a postdoctoral fellow to be our 2017 "Rising star of Environmental Nanosciences".

The selected researcher will be invited to present a talk on their research and also on their journey to date - how they got where they are and what motivated them to pursue a career in environmental nanoscience! Nominations by 2nd June 2017!



7TH INTERNATIONAL IMBG MEETING on Metallic Nanoparticles : Health, Environment, applications and Safer-by-Design

<http://www.imbg-grenoble.fr/IMBG2017/index.htm>

Géraldine Sarret
IMBG, LabEx SERENADE
geraldine.sarret@univ-grenoble-alpes.fr

The Institute of Metals in Biology of Grenoble (IMBG) organizes in September 2017 its 7th biannual International Meeting that will be dedicated to "Metallic nanoparticles: health, environment, applications and safer-by-design".

7th IMBG International Meeting will be held in Villard-de-Lans, a village located close to Grenoble in the beautiful Vercors mountains.

The meeting will take place from the 13th to the 15th of September 2017 and will be preceded by two days of Advanced Courses focused on experimental approaches. We will like to favor the interaction among participants during the week in a format close from the one of Gordon conference. That is why we plan to welcome around 100 to 120 people to the meeting and not more than 30 people during the courses dedicated to PhD students, post-doc engineer and scientists.

Confirmed invited speakers :

- Philip Demokritou (Harvard Univ. USA),
- Nguyen T. K. Thanh (UCL Healthcare Biomagnetic and Nanomaterials Laboratories, London, UK),
- Dominique Lison (Univ. Louvain, Belgium),
- Wendel Wohlleben (BASF, Germany),
- Francesco Stellacci (EPFL, Lausanne),
- Denise Mitrano (EMPA Zurich),
- Kristin Schirmer (Eawag),
- Bengt Fadeel (Stockholm, Sweden).

Questions can be sent to the organizers:
imichaud@cea.fr, marie.carriere@cea.fr
geraldine.sarret@univ-grenoble-alpes.fr



7TH ANNUAL WORLD CONGRESS OF NANOSCIENCE AND TECHNOLOGY - 2017

Stella Zhang
BIT Congress, Inc.
stella@bitconferences.com

Nano S&T-2017 with the theme "Welcome to a New Era of Nano-Level" will be held in Hilton Fukuoka Sea Hawk, Japan during October 24-26, 2017.

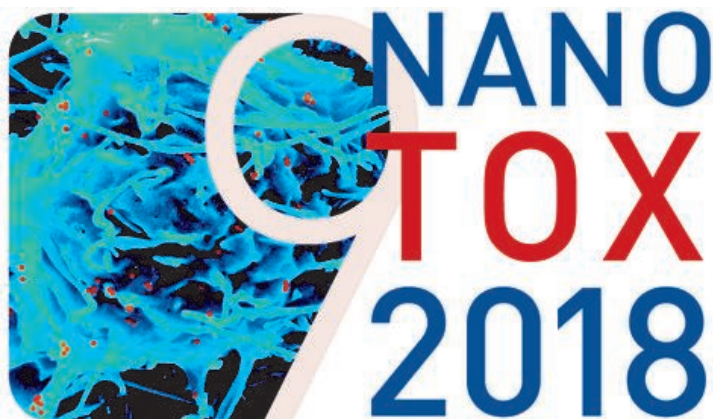
It is intended to provide a platform for professionals around the world to exchange state-of-the-art research and development and identify research needs and opportunities in this emerging field.

<http://www.bitcongress.com/nano2017/>





NANOTOX 2018

INTERNATIONAL
CONFERENCE ON
NANOTOXICOLOGY18. – 21. September
Neuss · Germany

NanoTox 2018 Dorint Hotel Neuss, Germany (near Düsseldorf)

Save the Date: the 9th International Conference on Nanotoxicology will take place at Dorint Hotel Neuss/Duesseldorf from 18th September to 21st September 2018.

The latest information will be posted at www.nanotox2018.org.

Since Miami 2006 a sequence of 8 international conferences have been held at international locations such as Zurich, Edinburgh, Beijing or Boston. On behalf of the organizing committee we would be very happy to welcome you to the next event in this series of very important international conferences on the toxicology of nanomaterials. The conference venue will be located in Neuss, near Duesseldorf. It is well connected via the airports of Duesseldorf, Cologne-Bonn and Frankfurt, from where a fast train takes you to the conference site (ICE). Neuss is part of the so-called “Ruhrgebiet” the biggest industrial area in Europe. Nevertheless, the hotel is surrounded by small woods and parks and the “Old Town of Duesseldorf” with its famous breweries and restaurants is only a few minutes away.

More than 10 years have been gone since the first conference, so it will be the time to contemplate about the outcome of the research of the last decade. We should discuss the question where we will go within the next decade and how appropriate are the assays we use to make our decisions about hazard and exposure of nanomaterials. The key issue for the future is the reliability of risk assessment based on the available data. This event will offer a platform for all interested scientists, industry partners and regulatory bodies to discuss the latest results and developments in nanosafety research. Join the Nanotox community!

The special focus of NanoTox 2018 will be “New tools in risk assessment of nanomaterials” such as read-across, grouping and categorization.

The organizers

Harald F. Krug, Empa & NanoCASE, Switzerland
Katja Nau, KIT, Germany
Matthias Neumann, DECHEMA, Germany and
Christoph Steinbach, DECHEMA, Germany are
looking forward to meeting you!



Questions?

Please contact the local organizing committee for scientific questions:

hfk@nanocase.ch

for organizational questions:

Neumann@dechema.de



DATE	EVENT (CLICK FOR MORE INFORMATION)
09 April 2017	2017 IEEE 12th International Conference on Nano/Micro Engineered and Molecular Systems (NEMS, Los Angeles, United States)
24 April 2017	Nanomaterials : Industrial Workshop on Safe-By-Design (Bilbao, Spain)
24 April 2017	International Conference and Exhibition on Pharmaceutical Development and Technology (Dubai, UAE)
24 April 2017	International Conference on Advanced Graphene Materials and Semiconductors
26 April 2017	3rd International Smart Materials & Surfaces Conference (Paris, France)
26 April 2017	The 3rd Edition of the European Graphene Forum 2017 Conference and Exhibition (EGF 2017) (Paris, France)
07 May 2017	European Foundation for clinical nanomedicine (CLINAM -Basel, Switzerland)
08 May 2017	10th Asia-Pacific Pharma Congress (Singapore)
10 May 2017	IDTechEx Graphene and 2D Materials event (Berlin, Germany)
14 May 2017	World Innovation 2017 Conference & Expo (Washington DC, USA)
28 May 2017	11th International Conference on New Diamond and Nano Carbons 2017 (Cairns, Australia)
29 May 2017	International Conference and Exhibition on Nanomedicine and Drug Delivery (Osaka, Japan)
29 May 2017	8th International Symposium on Nanotechnology, Occupational and Environmental Health (Konventum, Elsinore, Denmark)
29 May 2017	8th International Conference and Exhibition on Materials Science and Engineering (Osaka, Japan)
01 June 2017	NanoTech Poland 2017 (Poznan, Poland)
02 June 2017	The Engineering Materials show (Derby, UK)
05 June 2017	16th World Nano Conference (Nano 2017, Milan, Italy)
05 June 2017	International Nanotechnology Conference for Renewable Materials (Montreal, Canada)
06 June 2017	The 8th International Conference on Nanotechnology: Fundamentals and Applications (ICNFA'17) (Rome, Italy)
07 June 2017	Commercialisation of nanomaterials: process, issues, and management (London, UK)
12 June 2017	9th World Congress on Materials Science and Engineering (Rome, Italy)
12 June 2017	2nd International Conference on Applied Surface Science (ICASS, Dalian, China)
14 June 2017	6th Annual World Congress of Advanced Materials (WCAM-2017, Xi, China)
20 June 2017	2nd Open meeting on Standardisation for Nanotechnologies and Nanomaterials (Malta)
21 June 2017	EuroNanoForum 2017 (Valletta, Malta)
22 June 2017	InterNanoPoland (Katowice, Poland)
25 June 2017	18th International Conference on the Science and Application of Nanotubes and Low-dimensional Materials (Belo Horizonte, Brazil)
26 June 2017	3rd International Conference and Expo on Ceramics and Composite Materials (Madrid, Spain)
28 June 2017	Nanotech France 2017 International Conference and Exhibition (Paris, France)
28 June 2017	Nanometrology France 2017 Conference and Exhibition (NanoMetrology 2017) (Paris, France)
28 June 2017	NanoMaterials for Energy and Environment 2017 (NanoMatEn 2017) (Paris, France)



DATE	EVENT (CLICK FOR MORE INFORMATION)
01 July 2017	NANOTECHNOLOGY 2017 (Thessaloniki, Greece)
02 July 2017	7th International Conference on Nanomaterials by Severe Plastic Deformation (Sydney, Australia)
03 July 2017	16th Annual Medicinal & Pharmaceutical Sciences Congress (Kuala Lumpur, Malaysia)
03 July 2017	4th Annual Congress on Drug Discovery & Designing (Bangkok, Thailand)
04 July 2017	International Conference on Nanotechnology & Nanomaterials (Dubai)
07 July 2017	2ND INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY AND NANOMATERIALS IN ENERGY (ICNNE2017) (Lyon, France)
10 July 2017	International Conference on Nanobiotechnology (Chicago, USA)
11 July 2017	World Congress on Regulations of Nanotechnology (Chicago, USA)
11 July 2017	The 9th International Conference on Advanced Materials (ROCAM 2017, Bucharest, Romania)
12 July 2017	nano Korea 2017 (Seoul, Korea)
16 July 2017	The Twenty-Fifth Annual International Conference on COMPOSITES/NANO ENGINEERING (ICCE-25) (Rome, Italy)
17 July 2017	International WE-Heraeus-Physics School on Exciting nanostructures: Probing and tuning the electronic properties of confined systems
17 July 2017	International Conference on Graphene and Semiconductors (Chicago, Illinois, USA)
17 July 2017	International Conference on Diamond and Carbon Materials (Chicago, Illinois, USA)
19 July 2017	9th International conference on Advanced Nanomaterials (ANM2017 Avelro, Portugal)
19 July 2017	3rd International conference on Advanced graphene materials (ANM2017 Avelro, Portugal)
19 July 2017	2nd International conference on Advanced magnetic and spintronics materials (ANM2017 Avelro, Portugal)
19 July 2017	1st International conference on Advanced polymer materials and Nanocomposites (ANM2017 Avelro, Portugal)
23 July 2017	17th International Conference and Exhibition on Nanomedicine and Nanotechnology in Health Care (Melbourne, Australia)
24 July 2017	3th International Conference and Exhibition on Pharmaceutical Nanotechnology (Rome, Italy)
24 July 2017	International Conference and Exhibition on Pharmaceutical Nanotechnology (Rome, Italy)
25 July 2017	IEEE 17th International Conference on Nanotechnology (IEEE-NANO, Pittsburgh, United States)
25-Jul-2017	Ultrafine Bubble Technology Symposium (Singapore)
26-Jul-2017	International Conference on Nanotechnology, Nanomaterials & Thin Films for Energy Applications (Aalto University, Finland)
26 July 2017	1st Global Conference on Materials Science and Nanotechnology (Baltimore, US)
27 July 2017	10th International Conference on Emerging Materials and Nanotechnology (Vancouver, Canada)
01 August 2017	7th International Conference on Manipulation, Manufacturing and on the Nanoscale (3M-NANO) (Shanghai, China)
07 August 2017	International Conference on Nanotechnology 2017 (Beijing, China)
07 August 2017	ICANM 2017: International Conference & Exhibition on Advanced & Nano Materials (Toronto, Canada)
21 August 2017	3rd Global Nanotechnology Congress and Expo (Dallas, USA)



DATE	EVENT (CLICK FOR MORE INFORMATION)
22 August 2017	1st European Conference on Chemistry of Two-Dimensional Materials (Chem2DMat)
22 August 2017	Nanogenerator and Piezotronics Symposium (Stockholm, Sweden)
22 August 2017	Global Graphene Forum (Stockholm, Sweden)
23 August 2017	The International Conference of Theoretical and Applied Nanoscience and Nanotechnology (TANN'17) (Toronto, Canada)
29 August 2017	14th European Conference on Molecular Electronics (ECME 2017 Dresden, Germany)
31 August 2017	19th Nano Congress for Next Generation (Brussels, Belgium)
06 September 2017	11th International Conference on Advanced Materials and Processing (Edinburgh, UK)
10 September 2017	8th International Conference on Fracture of Polymers, Composites and Adhesives (Les Diablerets, Switzerland)
10 September 2017	The Eleventh International Conference on Quantum, Nano/Bio, and Micro Technologies (Rome, Italy)
11 September 2017	International Conference on Advanced Nanotechnology (Amsterdam, Netherlands)
13 September 2017	Nanophotonics and Micro/Nano Optics International Conference 2017 (Barcelona, Spain)
17 September 2017	International Conference on Nanotechnology and Nanoscience (Amsterdam, Netherlands)
17 September 2017	18th Nanotechnology Products And Expo (Seoul, Korea)
25 September 2017	Graphene Week 2017 (Athens, Greece)
25 September 2017	2nd Global Congress & Expo on Materials Science and Nanoscience (Valencia, Spain)
25 September 2017	12th Annual Pharma Middle East Congress (Dubai, UAE)
25 September 2017	12th Annual Congress on Materials Science and Nanotechnology (Dubai, UAE)
26 September 2017	Micro Nano MEMS 2017 (Birmingham, UK)
28 September 2017	International Conference on Nanochemistry (Atlanta, USA)
28 September 2017	2nd International Conference on Biochemistry (Dubai, UAE)
02 October 2017	3rd International Conference on Polymer Science and Engineering (Chicago, USA)
02 October 2017	3rd International conference on rheology and modelling of materials (Miskolc, Hungary)
09 October 2017	3rd International Conference on Nanomaterials: Fundamentals and Applications (Slovakia, Europe)
10 October 2017	INC 2017 Industrial Nanocomposites Conference (Stuttgart, Germany)
16 October 2017	11th World Drug Delivery Summit (Baltimore, USA)
16 October 2017	5th International Congress and Expo on Nanotechnology and Materials Science (Dubai, UAE)
18 October 2017	15th World Medical Nanotechnology Congress & Expo (Osaka, Japan)
19 October 2017	9th Annual Congress on Drug Design & Drug Formulation During (Seoul, South Korea)
19 October 2017	16th Annual Medicinal & Pharmaceutical Sciences Congress (Seoul, South Korea)
26 October 2017	13th International Conference on Advanced Materials and Nanotechnology (Osaka, Japan)
27 October 2017	Nano USA 2017 - International Conference and Exhibition on Nanoparticles & Nanotechnology (USA)



DATE	EVENT (CLICK FOR MORE INFORMATION)
02 November 2017	4th HVM Graphene + New Materials 2017 (Cambridge, UK)
06 November 2017	Annual summit on Nanomedicine & its applications (New Orleans, USA)
09 November 2017	BIT's 1st World Congress of Biomedical Engineering-2017 (Xian, China)
12 November 2017	6th International Conference on Ultrafine Grained and Nano-Structured Materials (Kish Island, Iran)
13 November 2017	13th International Conference and Exhibition on Materials Science and Engineering (Las Vegas, Nevada, USA)
13 November 2017	13th International Conference on Nanotek and Expo (Atlanta, USA)
13 November 2017	18 th Nanotechnology Products and Summit (Atlanta, USA)
13 November 2017	22nd International Conference and Expo on Nanoscience and Molecular Nanotechnology (Vienna, Austria)
13 November 2017	Global Nanomaterials Congress (Singapore)
23 November 2017	17th International Conference and Exhibition on Nanomedicine and Nanotechnology in Health Care (Melbourne,

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 opportunities ♦ that you want the
 nanosafety community to know about?
 Here's how you can inform everyone....



www.nanosafetycluster.eu