



## Welcome to the NSC Newsletter-Winter 2018

Thank you once again for all your contributions and your continued support of the NSC Newsletter.

Some of the highlights in this issue include news about the [NanoSafety Cluster meeting in Athens](#) next month, in conjunction with the next NanoFASE Project meeting. The NSC event will be looking at areas of synergy and overlap for cross-project contributions to the H2020 midterm review, and the Dissemination WG will be focusing on the added value of the Cluster to nanosafety stakeholders. The WG has successfully applied for the [Common Dissemination Booster service](#), which will benefit all NSC Projects.

[Pages 4-5](#) profile two new large-scale NSC projects which have just kicked-off: H2020 GRACIOUS and BIORIMA, both of which are central to NSC activities in the development of classification frameworks for risk assessment of nms and safer design, as well as risk management framework for nano-biomaterials. Later in the newsletter ([page 22](#)) is an invitation from BIORIMA to its first training school on Risk Assessment and Risk Management of Nano-Biomaterials in Medical Applications which takes place in April.

In Project News, [NanoDefine](#) reports on the release of the e-tool—a key project outcome for which a video guide is available. On [page 11](#), [eNanomapper](#) announces the Jaqpot—an open access web app for predicting adverse effects of enms; and the [toxFlow web app](#) for toxicity prediction. Following a report on the recent success of [NanoMONITOR](#), the Publications section includes details from [SUN](#) regarding five different publications of its ground-breaking results. INSPIRED, Hi-Response and NANOGENTOOLS have also published [research output for real-life risk profiles](#), which is well worth a read.

Among the events profiled in this issue, NanoFASE is holding a full-day scientific session at SETAC Europe ([page 24](#)) as well as a unique opportunity for stakeholders to take part in a fact-finding consultation ([page 27](#)).

Finally, if you have any forthcoming events, publications or project output that you want the community to know about, the deadline for submission of news items for the Spring issue is Monday April 16th. On behalf of WG Dissemination, we hope you find this issue of interest and we look forward to receiving your contributions.

Warm wishes

Lesley Tobin

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## NSC Meets in Athens

The next EU NanoSafety Cluster Scientific Meeting, organised with the support of the NanoFASE project, will take place in Athens, Greece, March 22-23 2018.

The next EU NanoSafety Cluster **Scientific Meeting** is being organised with the help and in coordination with the next NanoFASE Consortium Meeting. It will take place at the **Royal Olympic Hotel**, Athens, Greece, March 22-23 2018. The meeting will start at 09:00 on Thursday 22 March and is scheduled to end at 13:00 on Friday 23 March.

The Scientific meeting will include updates on the progress, current and future activities of the current NSC Working Groups and active Task Forces as well as scientific presentations of interest to the wider NSC community. Satellite sessions will also be scheduled on matters and actions of significant scientific interest for the community.

### Agenda items as the Newsletter goes to press include:

- Cross-projects scientific contributions to the H2020 Midterm Review
- Dissemination Working Group campaign planning "Demonstrating added value of Cluster progress to nanosafety stakeholders"

Further details on the agenda and sessions will soon be made available on [nanosafetycluster.eu](http://nanosafetycluster.eu). For comments, suggestions, information and help with room reservations at the Royal Olympic Hotel at Meeting rates please contact either Anastasios (Tassos) Papadiamantis ([A.Papadiamantis@bham.ac.uk](mailto:A.Papadiamantis@bham.ac.uk)) or Thomas (Tom) Carney ([T.Carney@bham.ac.uk](mailto:T.Carney@bham.ac.uk)).



## The NanoSafety Cluster webinar

The NanoSafety Cluster webinar hosted on November 20 2017 was the first in a series of webinars which aim to highlight key Cluster outcomes. They aim to inform and engage all interested stakeholders, both within NSC projects and from the wider community across the world. This webinar provided three introductory presentations to the NSC and future webinars will focus on more specific topics and outcomes from NanoSafety Cluster.

### Presentations:

Éva Valsami Jones—NSC presentation  
 Flemming Cassee—NanoReg/ProSafe "White Paper" in a nutshell  
 Andreas Falk—Nanoinnovation from within the NSC.

### Links to download the publications mentioned in his talk:

- A methodology on how to create a real-life relevant risk profile for a given nanomaterial:  
<http://www.sciencedirect.com/science/article/pii/S1871553217300518>
- Nanosafety in Europe 2015 – 2025  
<https://www.nanosafetycluster.eu/news/83/66/Nanosafety-in-Europe-2015--2025.html>
- Closer to the market Roadmap (CTTM)  
<https://www.nanosafetycluster.eu/news/189/66/Closer-to-the-market-Roadmap-CTTM.html>

### Nanosafety in Europe 2015-2025: Towards Safe and Sustainable Nanomaterials and Nanotechnology Innovations

Kai Savolainen (coordinator), Ulrika Backman, Derk Brouwer, Bengt Fadeel, Teresa Fernandes, Thomas Kuhlbusch, Robert Landsiedel, Iseult Lynch, and Lea Pytkäinen together with the members of the NanoSafety Cluster who have contributed to the document and listed in an alphabetical order in the Annex.



# NSC WG Dissemination

## Common Dissemination Booster



We are pleased to announce that the NanoSafety Cluster Training/Dissemination working groups have successfully applied for the '[Common Dissemination Booster](#)' (CDB) service from the European Commission.

Dissemination people from all projects within the NSC will benefit directly from the online service including tailored expert help.

### Here's the timeline for action:

**Right Now:** Register to be part of the training by following the instructions below. *All Cluster projects are expected to be represented so Dissemination people please sign on – you can indicate your membership in several projects.*

**Feb—March 2018:** Leading up to Athens Cluster Meeting: We will use our shared [CDB Workspace](#) to select our "dissemination portfolio" – that is, **nominate the Cluster reports and roadmaps, project Decision Support Systems and White Papers**, etc. that can be boosted into the limelight to reach the full range of our stakeholders.

**22 March:** Athens: The Dissemination breakouts, rooting in the Athens Mid-term Scientific Review, will set priorities and dates for a campaign **demonstrating to stakeholders the added value/progress achieved on nanosafety through H2020 and FP7**. At the end of the day we'll give feedback by phone to our CDB expert [Nick Ferguson](#).

**11 APRIL – 7 MAY approx:** We'll access [Service 4](#), Dissemination capacity building: *Needs assessment and skills training to help create effective messages and leverage social media, websites and press releases.*

**JUNE-NOV:** We'll access [Service 5](#), Dissemination campaign management: *"Shadowing" the delivery of our dissemination plan, creation of content-rich messages that address IP and copyright, impact analysis, sustainability and legacy plan.*

### Each project representative should register ASAP (before Athens) via the following link:

<https://www.cdbservices.eu/user/login>.

From the 1<sup>st</sup> drop-down menu, choose the Project Group **CDB02-GRACIOUS**

From the 2<sup>nd</sup> drop-down menu, choose the project(s) you represent.

If you are not able to locate your project(s) in the drop-down menu or have other questions, please contact Stella Stoycheva ([s.stoycheva@yordasgroup.com](mailto:s.stoycheva@yordasgroup.com)).

Further information about the training schedules will be delivered in due course.

We look forward to welcoming you to the NSC CDB Training!

Best regards,

**NSC CDB Team:**

**Stella Stoycheva**

Dissemination Executive for GRACIOUS and CDB Service Contact Point

**Judith Friesl**

Dissemination Manager for GRACIOUS and NSC Communication, Training and Education WG Co-Chair

**Claire Skentelbery**

NSC Dissemination WG Chair

**Claire Mays**

NSC Dissemination WG Co-Chair



## Successful Kick-off for H2020 GRACIOUS Project.

The newly started H2020 GRACIOUS project will develop a highly innovative science-based framework that supports the assessment of risk posed by the ever increasing array of nanomaterials on the market and under development. The framework will streamline the process for assessing their risk by logically grouping nanomaterials thereby allowing extrapolation between (read-across) nanomaterials and reducing the need to assess exposure to and toxicity on a case by case basis.

At the kick-off meeting which was held in Edinburgh, UK on 22-23 January 2018, members of the consortium discussed how the project goal was to be achieved and how to involve key partners in of small, medium and large scale industries as well as national and international policy makers and regulators.

Industry has the ability to modify the chemical and physical characteristics of materials at the nanoscale leading to a wide array of nanomaterials (NMs) varying in size, morphology and surface characteristics. Due to financial, time and ethical considerations, safety testing of every unique NM for their potential adverse effects is virtually impossible.

For these reasons, more efficient ways to obtain safety information are needed. Bringing together 23 partners spanning Europe and the USA, GRACIOUS aims to generate a highly innovative science-based framework accounting for those issues with the ultimate aim of streamlining the risk assessment process.

The GRACIOUS framework will be underpinned by scientific hypotheses, identifying endpoints relevant to grouping and read-across. To generate the knowledge and data needed to identify and test these hypotheses Intelligent Testing Strategies (ITs) will be developed to cover all domains of relevance for risk assessment:

1. Lifecycle environmental release and human exposure
2. What they are: physicochemical identity
3. Where they go: Environmental fate, uptake and toxicokinetics
4. What they do: human and environmental toxicity

The ITs will reduce, refine and replace (where possible) the need for animal testing by promoting the use of modelling (e.g. in silico, fate, exposure), in vitro and cell-free tests.

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



Image: GRACIOUS Project Kick off Meeting

**GRACIOUS: Grouping, Read-Across and Classification framework for regulatory risk assessment of manufactured nanomaterials and Safer design of nano-enabled products**



## BIORIMA – BIOMaterial Risk Management

<https://www.biorima.eu>  
[info@biorima.eu](mailto:info@biorima.eu)

The EU funded H2020 Research and Innovation action BIORIMA started at the beginning of November 2017. It aims to develop an integrated risk management framework for nano-biomaterials used in advanced therapeutic medicinal products and medical devices.



Coordinated by Lang Tran at the Institute of Occupational Medicine - IOM Edinburgh, BIORIMA has a runtime of 4 years, with 41 consortium partners and a project budget of almost 8.000.000 €.

A first BIORIMA pre-meeting of the work package leaders took place in December in Amsterdam, with the official Kick-off-Meeting held in Paris from 19th to 21st February 2018

### Risk Management of Biomaterials

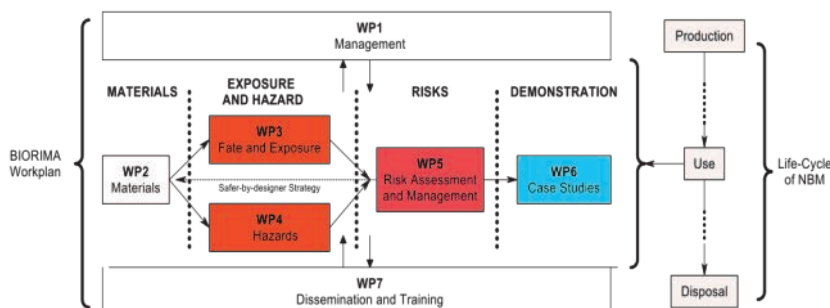
BIORIMA aims to develop an Integrated Risk Management (IRM) framework for NBM used in ATMP and MD. The BIORIMA IRM framework is a structure upon which the validated tools and methods for materials, exposure, hazard and risk identification/assessment and management are allocated plus a rationale for selecting and using them to manage and reduce the risk for specific NBM used in ATMP and MD.

### The BIORIMA IRM framework will be

- Robust and readily applicable to past and current generations of NBM because it is built on the large and growing database of evidence and experience of researchers in Nanosafety and Nanomedicine.
- Flexible, in its modular construction, which can easily integrate new scientific results to address the need of future generations of NBM.
- Beyond the state of the art for NBM safety by providing an encompassing and consistent framework applicable to both NBM and ENM. Specifically, the integration of knowledge from Nanosafety regarding Exposure/Hazard/Risk will advance the current status of NBM safety considerably. An unified IRM framework for both medicinal and engineered nanomaterials is clearly of tremendous advantage to the standardisation and regulation of these materials . The weight of evidence to support and the transparency in the implementation of the tools/ methodologies will undoubtedly make the BIORIMA IRM framework an essential and invaluable contribution to the future development and sustainability of biomaterial technology.

### The BIORIMA IRM framework will consist of

- Validated methodologies and tools to identify the potential Exposure posed by NBM to humans and the environment.
- Validated methodologies and tools to identify the potential Hazard of NBM to humans and the environment, including a specific strategy for Intelligent Testing (ITS).
- A Tiered Risk Assessment (TRA) for NBM used in ATMP and MD; Risk Management strategies and systems, based on validated methodologies, tools, and guidance, for monitoring and reducing the risks of NBM together with methods for evaluating them.





## Introducing Nan-O-Style

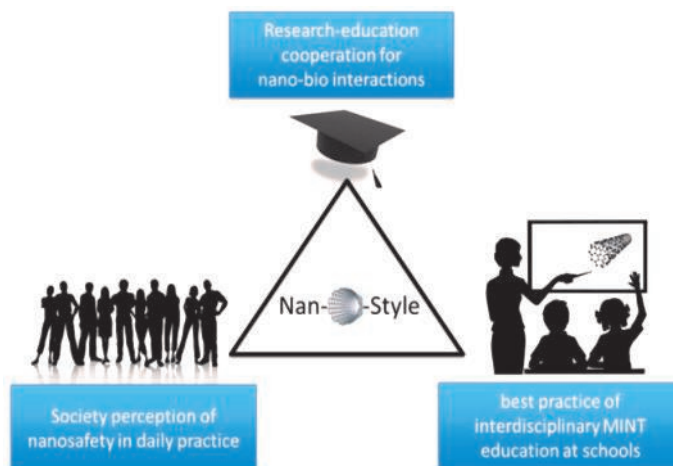
Nan-O-Style is an interdisciplinary research project, which investigates interactions between nanomaterials (NMs) in consumer products with substances from daily life with a special focus on modern lifestyle products (MLPs) used by adolescents.

### The scientific aims of the project are:

- Investigation of modern lifestyle habits by adolescents and the associated new possibilities of combined exposure to NMs and MLPs
- Determination of the NM-MLP interactions by Nanoparticle Tracking Analysis (NTA) and the resulting biological effects in cell culture models
- Generation of knowledge and attitudes towards nanotechnology from adolescents, adults and employees in small and medium enterprises (SMEs) working in the field

### The educational aims of the project are:

- the development of an individually adapted communication style with the adolescents, a digital collaborative learning system
- the compilation of an education initiative about nanotechnology including teaching resources (Nanobox) and peer-teaching programs.



In order to achieve a high variety of perspectives, students from different types of Austrian higher schools (technical/scientific vs. economic vs. artistic) will work in close contact with scientists from academia. Due to the within Nan-O-Style acquired competences and the established network between academic scientists, students and educational institutions, the students will develop new models for interdisciplinary teaching in mathematical/scientific/technical (MINT) subjects and apply them as best practice examples. We will particularly focus on schools with an economic or fashion background which typically have a higher share of girls. A number of pre-scientific projects in nano-technological, nano-biological or nano-educational topics will be carried out. This approach towards interdisciplinary MINT education will further extend to the education of teachers (coordination of earlier EU framework projects NanoTOES and NanoEIS by Prof. Duschl). Nan-O-Style is internationally well-connected as it further includes educational partners in Israel and Spain.



Image Caption: The Duschl group at the University of Salzburg hosted the kick-off meeting of their Sparkling Science project Nan-O-Style

Image credit: University of Salzburg

Project type: §27 Sparkling Science project funded by Austrian Ministry of Science and Economy (BMWFV)

Run time: October 1st, 2017 - December 31st, 2019



# PANBioRA - Personalized and/or Generalized Integrated Biomaterial Risk Assessment.

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The activities of the PANBioRA project started in January 2018. This NMBP-12-2017 Research and innovation action aims at providing a comprehensive solution for the time- and cost-effective risk assessment of i) new biomaterials under health or disease states or ii) a given biomaterial for each patient in a personalized manner. It will standardize the evaluation of biomaterials and open the venue for pre-implantation, personalized diagnostics for biomaterial based applications.

PANBioRA will provide a modular platform to assess risks at different aspects and length scales. This comprises antibody response, cytotoxicity/genotoxicity at cell level, systemic and local effects at tissue and connected tissues (organ-on-a-chip) level. Moreover, physicochemical and biomechanical characterisation as well as predictive modelling at systems level will complement the system. This will be achieved by connecting testing modules in a structure supported by web-based modelling and risk radar tools together with a biomechanical testing system. The platform will incorporate standardized protocols yielding significantly more information than the current methods for biomaterial risk assessment. Its accuracy will be demonstrated using known reference materials and validated in a preclinical setting.

PANBioRA will for the first time, predict the patient specific response to a given biomaterial before its implantation. This measure will allow for the selection of the best suitable material, minimizing side effects and improving health outcomes. It will also accelerate the process of validation of the biocompatibility of new devices by providing an automated, comprehensive process for the parallel assessment of risks at different scales aiding new biomaterial discovery and commercialisation.

Altogether, PANBioRA will lead to a substantial economic impact due to a reduction of the amount of tests, decrease in healthcare costs due to complications. It will provide the necessary tools proper risk management related to biomaterials.

To achieve the targeted objectives described above an international and multidisciplinary consortium has been assembled: [PROTIP Medical SAS France](#), [CLASSIC SOFTWARE MANUFACTURING LIMITED Ireland](#), [BIODEVICE SYSTEMS SRO Czech Republic](#), [PROTOBIOS OU Estonia](#), [ELVESYS SAS France](#), [Steinbeis Advanced Risk Technologies Institute doo Kragujevac Serbia](#), [Steinbeis Advanced Risk Technologies GmbH Germany](#), [COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES France](#), [PRO-ACTIVE Belgium](#), [AALTO-KORKEAKOULUSAATIO Finland](#), [TURGUT OZAL EDUCATION SHA Albania](#), [THE UNIVERSITY OF NOTTINGHAM United Kingdom](#), [AGENCIA ESTATAL CONSEJO SUPERIOR DEINVESTIGACIONES CIENTIFICAS Spain](#), [DUBLIN CITY UNIVERSITY Ireland](#), [INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE France](#), [CENTRE HOSPITALIER UNIVERSITAIRE DE LIEGE Belgium](#) and [STEINBEIS 2I GMBH Germany](#).

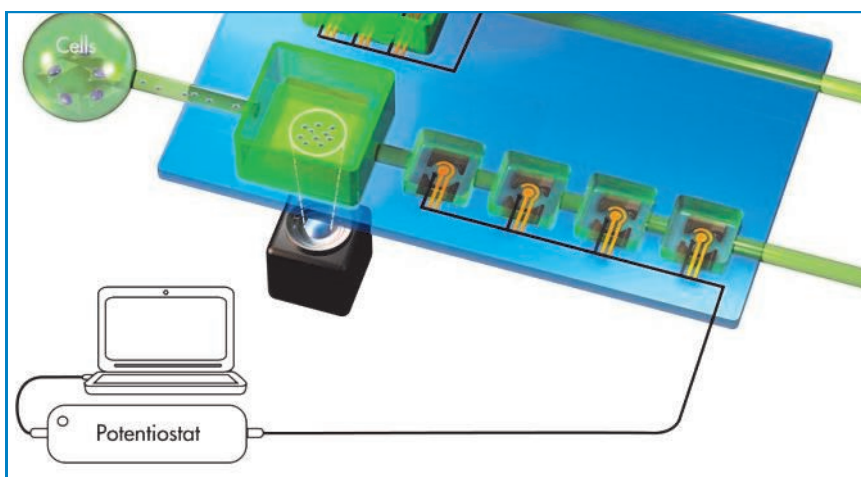


Image: Monitoring system (WP3-WP4) cell part

Image Credit [PROTIP Medical SAS France](#)

[PANBioRA EU-project](#)



[@PANBIORA](#)



## GREENSENSE - Sustainable, Wireless, Autonomous Nanocellulose-based Quantitative DoA Biosensing Platform.

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The activities of the GREENSENSE project were initiated in January 2018. This PILOTS-05-2017 Research and innovation action aims at developing a Sustainable, Wireless, Autonomous Nanocellulose-based Quantitative Drug-of-Abuse (DoA) Biosensing Platform.

In GREENSENSE we propose the development of a sustainable NC-based hybrid printed biosensing platform for DoA analysis, that integrates high-added value printed electronic components (a new biosensor, a NFC antenna, an energy storage system and an electrochromic display) with an enabling silicon microchip capable of multi sensor interrogation, data processing and management and wireless communication.



The core aspect of the project will be the use of nanocellulose (NC) and NC derivatives as: substrate for the printing of the electronics, lamination film for the encapsulation of the final device and as active component in the formulation of functional inks (conductive, electrochemical, electrolyte and dielectric). More specifically the project aims to:

- Pilot scale production of nanocellulose from sulphite/kraft pulp and crop/paper waste.
- Pilot scale fabrication of NC-based films by controlling: density, porosity, surface roughness, thickness, barrier and surface chemistry, transparency and mechanical properties.
- Formulation and development at pilot scale of different NC-based functional inks to be used in electronic components and biosensing platform development.
- Production, via screen-printing or inkjet printing, of all the printed electronic components that will compose the final biosensing platform.
- Design and fabrication of a monolithically integrated microchip with all required electronic functions.
- Validation of the fabrication of the printed electronic components and of the final biosensing platform by using existing high speed S2S manufacturing processes.
- Integration of all components on a single NC-based substrate to fabricate two generations of the biosensing platform by the use of pick and place technique.
- Performance assessment (from materials to biosensing platform), stability tests and testing with synthetic analytes.
- Sustainability assessment (from materials to biosensor platform) to evaluate compliance with environmental health and safety legislation and as a basis to establish a framework of eco-design requirements.
- Cost-benefit analysis of the different developed materials, components and the biosensing platform.

The final flexible, recyclable and ultra-low power consumption NC-based biosensing platform will be mass producible and, therefore, cost-effective, sustainable and environmentally friendly.

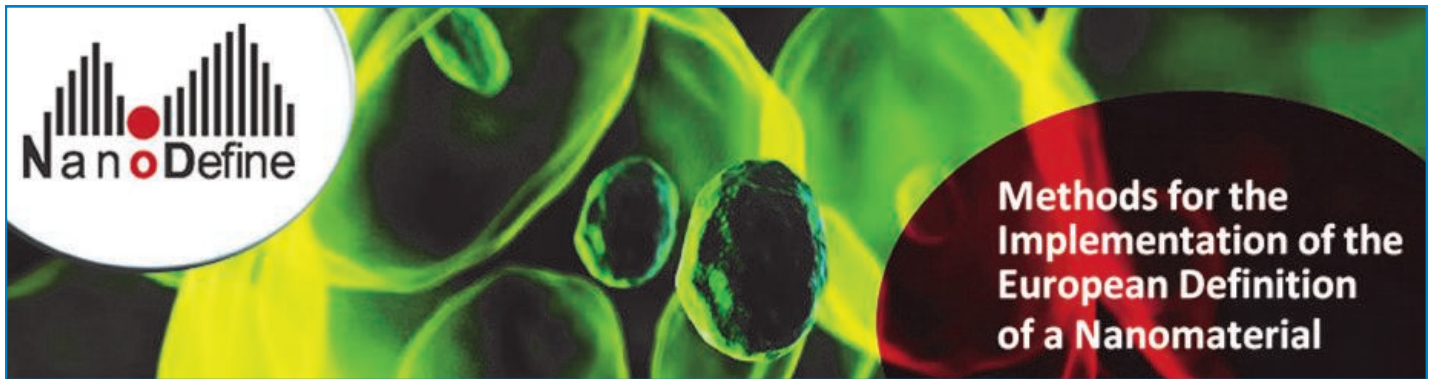
To achieve the targeted objectives described above an international and multidisciplinary consortium has been assembled:

LEITAT (Spain, <http://www.leitat.org/english/>), AIT (Austria, <https://www.ait.ac.at/#/>), MELODEA ltd (Israel, <http://www.melodea.eu/>), RISE (Sweden, <https://www.acreo.se/expertise/printed-and-organic-electronics-and-innventia>: <http://www.innventia.com/sv/Om-oss/Om-RISE-Bioekonomi/>), INFINEON TECHNOLOGIES AUSTRIA (Austria, <https://www.infineon.com/cms/austria/en/>), Atlas Medical (Jordan, <http://atlas-medical.com/>), GENES'INK (France, <http://www.genesink.com/en/home>), IMST GMBH (Germany, <http://www.imst.de/imst/de/>), PRO-ACTIVE (Belgium), PRELONIC (Austria, <http://www.prelonic.com/>), EMPA (Switzerland, <https://www.empa.ch/web/empa>) and COATEMA COATING MACHINERY GMBH (Germany, <http://www.coatema.de/en/>).





# NanoDefine e-tool Released



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In October 2017 the NanoDefiner e-tool, one of the outcome products of the NanoDefine project, was released in version 1.0.0 during NanoDefine's final outreach event and is publicly accessible.

As an implementation of a decision support framework for recommendation of measurement techniques for the identification of potential nanomaterials, the e-tool's purpose is to support academic and industrial institutions during the registration process of such. A video (7:22) provides a guided tour through the workflow and key features (activate subtitles for comments). For both, access to the e-tool and the preview video, please follow the link:

<http://nanodefine.eu/index.php/nanodefiner-e-tool>

The public e-tool service is thought for trial purpose only and requires a registration. For local deployment, NanoDefiner e-tool software packages can also be downloaded as web archive for installation on an application server. Alternatively, also a docker container as well as a virtual machine with pre-configured installation for direct use are provided.

Recently, the e-tool's source code has been released on GitHub to enable further transparency, contributions and forks. The development team is grateful for feedback as well as reported issues. To visit the e-tool's repository, please follow the link:

<https://github.com/NanoDefiner/NanoDefiner>

Interested institutions and researchers are highly welcome to contact Christoph M. Friedrich ([christoph.friedrich@fh-dortmund.de](mailto:christoph.friedrich@fh-dortmund.de)), University of Applied Sciences and Arts Dortmund (FH Dortmund), Germany, for more information or consultation.

## Related publications

- European Union (2011). *Commission Recommendation of 18 October 2011 on the definition of nanomaterial (2011/696/EU)*. Official Journal of the European Union, L 275, pp. 38–40.
- Babick, F., Mielke, J., Wohlleben, W., Weigel, S., Hodoroaba, V. D. (2016). *How reliably can a material be classified as a nanomaterial? Available particle-sizing techniques at work*. Journal of Nanoparticle Research, 18 (6), 158.
- Wohlleben, W., Mielke, J., Bianchin, A., Ghanem, A., Freiberger, H., Rauscher, H., Gemeinert, M., Hodoroaba, V. D. (2017). *Reliable nano-material classification of powders using the volume-specific surface area method*. Journal of Nanoparticle Research, 19(2), 61.



## NanoLeap—Open Consultation Workshop: Open Call for Tenders

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

Simon Clavaguera, CEA, [simon.clavaguera@cea.fr](mailto:simon.clavaguera@cea.fr)

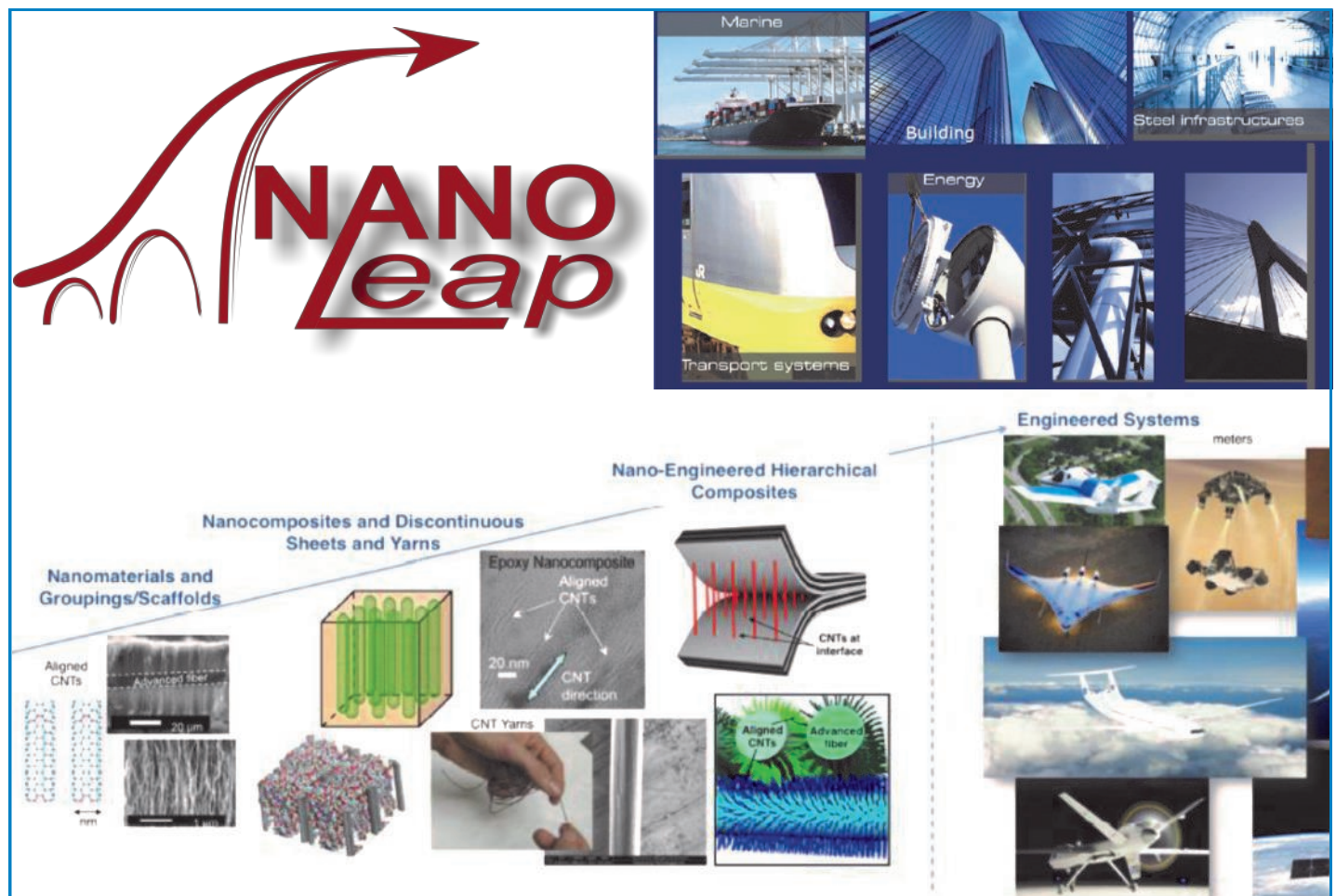
NANOLEAP project aims at the development of a coordinated network of specialized pilot lines for the production of nanocomposite based products for different civil infrastructure and building applications. The goal of this network is to support the research activities of European SMEs in the construction sector in nanocomposite products enabling the progress of the product to next steps of technology deployment such as installation of industrial lines and enter in the commercialization stage.

During the project the nanosafety issues related to the production of nanocomposite based products were assessed ahead of any realized risk to society. Studies on the implementation and effectiveness of Safer-by-Design approaches were conducted. Guidelines for production, use and handling of nanopowders and nanocomposites as well as risk minimization procedures were prepared based on occupational exposure assessments conducted during several field measurement campaigns. The goal was to provide guidance, EHS advices and recommendations to the owners of the ten pilot plants and their users. A brochure summarizing the report will be prepared and distributed to a large public over the next coming months.

An "open call for tenders" targeted to SMEs was launched in 2017 to validate and demonstrate the concept of "Open Access" and to step forward further collaboration after the end of EU financial support. The idea of this open call is to deploy a set of use cases where SMEs external to the Consortium and interested in developing or testing any of their technologies will be given the opportunity to use any of the pilot plants of the NANOLEAP network.

An Open Consultation Workshop will be organized in June 2018 in which the beneficiaries of the Open Call will present the outcomes of the collaboration and share their experiences.

For further details: <http://www.nanoleap.eu>





# eNanoMapper announces the Jaqpot

A new publication has been made available regarding Jaqpot, a comprehensive open-source web application for ENM modeling with emphasis on predicting adverse effects of ENMs (<http://www.jaqpot.org>).

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<http://enanomapper.net>

Addressing the need for harmonization in terms of databases, ontology, and modeling infrastructures, Jaqpot provides ontology-aware modelling capabilities, accessible by users via a User Interface, but also available to be integrated behind the curtain to other systems via the Application Programming Interface.

In this paper we describe the system architecture and outline the functionalities, which include nanoQSAR modeling, validation services, read-across predictions, optimal experimental design, and interlaboratory testing. The capabilities of Jaqpot allow it to provide the ability for more informed decision making from experimental design and coordinated collaboration of multiple laboratories to analysis and modelling of experimental results, giving researchers tools to produce insight.

We are currently working on providing Jaqpot with the ability to access the rich Nanoreg1 data (<https://apps.ideaconsult.net/nanoreg1>). Please stay tuned for more news on that.

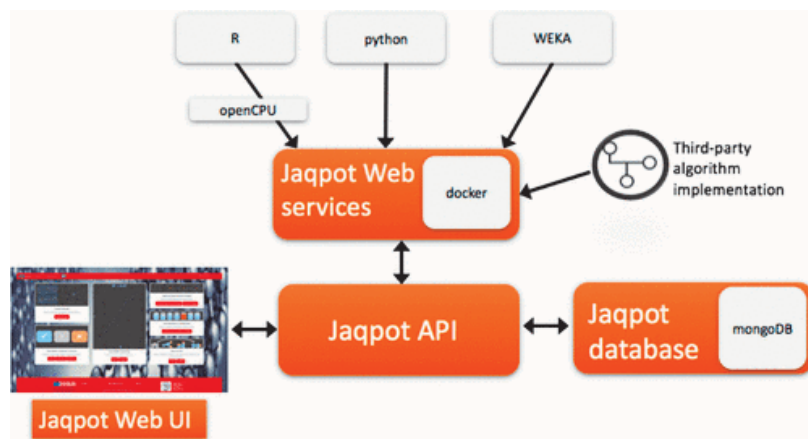
Users get their private space for data and models, or can take a look using the guest account (user: guest, password: guest). Apart from the paper, we have provided extensive documentation video tutorials and technical documents with detailed and easy to follow instructions (<http://www.jaqpot.org/documentation>).

DOI: [10.1021/acs.jcim.7b00223](https://doi.org/10.1021/acs.jcim.7b00223)

Available here: <https://pubs.acs.org/doi/abs/10.1021/acs.jcim.7b00223>

## Jaqpot Quattro: A Novel Computational Web Platform for Modeling and Analysis in Nanoinformatics

### Abstract



Engineered nanomaterials (ENMs) are increasingly infiltrating our lives as a result of their applications across multiple fields. However, ENM formulations may result in the modulation of pathways and mechanisms of toxic action that endanger human health and the environment. Alternative testing methods such as *in silico* approaches are becoming increasingly popular for assessing the safety of ENMs, as they are cost- and time-effective. Additionally, computational approaches support the industrial safer-by-design challenge and the REACH legislation objective of reducing animal testing. Because of the novelty of the field, there is also an evident need for harmonization in terms of databases, ontology, and modeling infrastructures. To this end, we present Jaqpot Quattro, a comprehensive open-source web application for ENM modeling with emphasis on predicting adverse effects of ENMs. We describe the system architecture and outline the functionalities, which include nanoQSAR modeling, validation services, read-across predictions, optimal experimental design, and interlaboratory testing.



# eNanoMapper announces toxFlow web app

## Available online

<http://www.enanomapper.net>

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toxFlow, a web-application developed for enriched read-across toxicity prediction, is now online. A sequential analysis workflow is suggested where users can filter omics data using enrichment scores and incorporate their findings into a correlation-based read-across technique for predicting a nanoparticle's toxicity based on its analogs. toxFlow integrates physicochemical, omics and biology information data for read-across prediction, which, to the best of our knowledge, is presented for the first time as a methodology as well as a fully implemented workflow.

The application provides a variety of cheminformatics and data omics-related services including data standardization, filtering and visualization, validation, and interpretation of predictive models giving links to external biological databases as well as exporting the findings. Given its input data flexibility, toxFlow can be a useful NP risk assessment tool not only for expert modellers but also for regulators and the industry. Although toxFlow was designed for NPs, its functionalities can potentially be applied to pure organic molecules taking for example into account multiple biological assay tests.

Future updates will include additional gene signature libraries, as well as further assessing mechanistic uncertainty via Adverse Pathway Outcomes and Key events (<https://www.effectopedia.org/>, <https://aopkb.oecd.org>) causally linked to the predictive toxicity.

toxFlow is accessible at <http://147.102.86.129:3838/toxflow/>.

Full publication can be accessed at <https://pubs.acs.org/doi/10.1021/acs.jcim.7b00160>

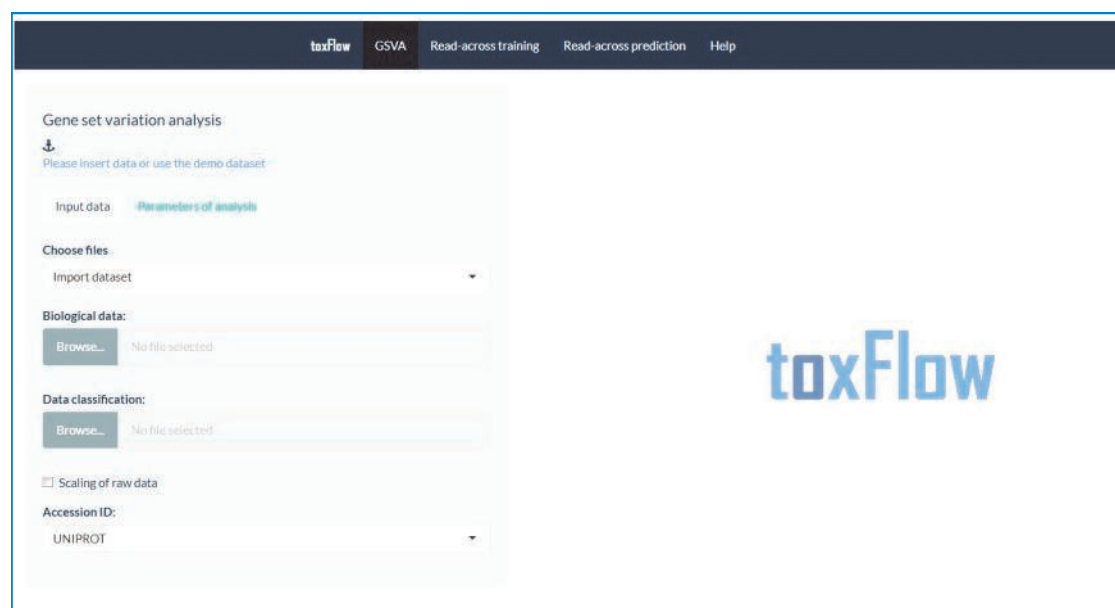


Image Caption *The toxFlow starting page. A sequential workflow is suggested for enrichment analysis, read-across training and prediction.*



## NanoMONITOR shows great achievement during its General Assembly Meeting and its 2nd Stakeholders' Day, Lancaster, UK



<http://www.lifenanomonitor.eu>

Stella Stoycheva, Yordas Group

[s.stoycheva@yordasgroup.com](mailto:s.stoycheva@yordasgroup.com)

The overall goal of the Life+ NanoMONITOR project is to develop a prototype system to generate robust, accessible, comparable and interoperable data on the concentration of nanomaterials in indoor workplaces, urban areas, and natural environments, as well as to promote the use of measured data to support the implementation of REACH regulation.

The results from the 4th Project General Assembly Meeting showed great advancement of the project. The meeting was held in Lancaster, UK on 23 October 2017 where the project partners presented the results obtained during the last 6 months. During the meeting the project partners discussed the successful outcome from the Mid Term Review and set the next steps in the project agenda. The feedback received from the funding body recognized that the technical report submitted to the EC in June was of a very good quality and showcased the smooth progress of the project.

The week continued with the project 2nd Stakeholders' Workshop: Safe Nanotechnology – Risk management, exposure and regulatory challenges, held on 24 October in Lancaster. The workshop brought together delegates from UK, Italy, Spain, India and Brazil to discuss the use of measured data on the concentration of engineered nanomaterials (ENMs) to support risk assessment, the implementation of safe exposure scenarios and to present the latest regulatory developments affecting nanomaterials in the EU and worldwide, including guidance on the best tools available to meet these obligations. At the same time the workshop served as an effective platform to disseminate the progress achieved within the project to a targeted audience of nanotechnology researchers, industry, and regulators. The delegates had the opportunity to test and provide feedback on the NanoMONITOR Monitoring Station Prototype and the NanoMONITOR Software Platform developed within the project. The recommendations collected during the workshop will be used for the further refinement of the applications.



NanoMONITOR Stakeholders events Lancaster 2017



NanoMONITOR\_Monitoring station prototype.png

The first Monitoring Station Prototype has been installed in one of the existing stations of the air quality network of the city of Valencia, generating data on the concentration of nanomaterials in areas with high traffic density. A second station will be installed in December 2017 in a commercial area located outside the city. Both stations will generate new data on the concentration of nanomaterials in city roads and highways of prime importance, to study potential effects on human health and the environment. All presentations from the workshop are made available to download from the project website here: [www.lifenanomonitor.eu/en/safe-nanotechnologyexposure-assessment-risk-management-andregulatory-challenges-workshop-presentations/](http://www.lifenanomonitor.eu/en/safe-nanotechnologyexposure-assessment-risk-management-andregulatory-challenges-workshop-presentations/)

### About NanoMONITOR

The LIFE+ project NanoMONITOR addresses the challenges of supporting the risk assessment of nanomaterials under REACH by development of a real-time information and monitoring system.

For more information about NanoMONITOR go to: <http://www.lifenanomonitor.eu>

Contact for Press: Email: [j.friesl@yordasgroup.com](mailto:j.friesl@yordasgroup.com)



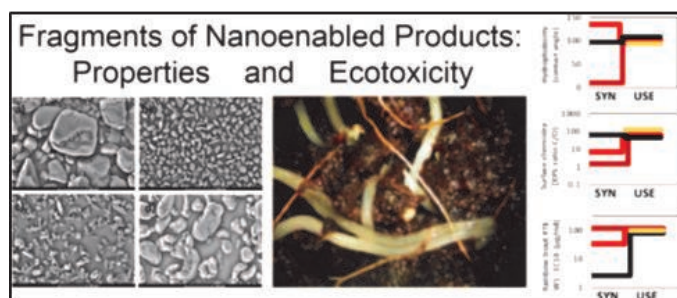
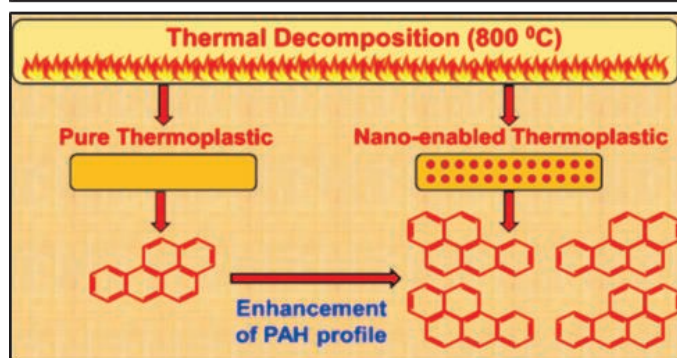
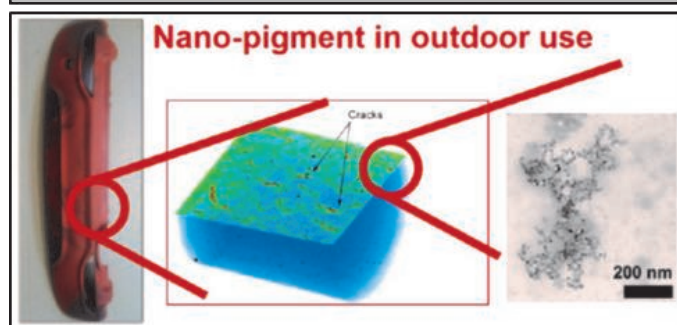
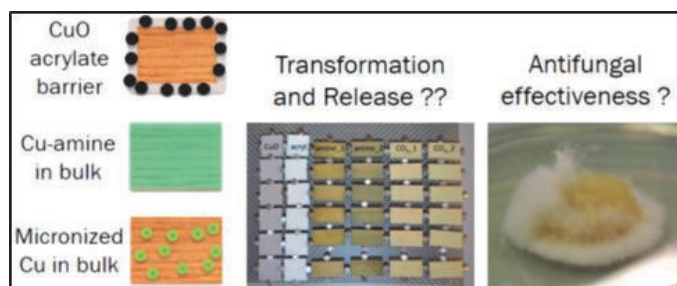
## SUN Project Publishes Results in Five ES&T Publications



Sustainable Nanotechnologies Project

The SUN (FP7) project investigated several case studies of NanoEnabled Products (NEPs), which have numerous uses in construction, transportation or consumer scenarios. Beyond the characterization of lifecycle release forms and rates (i.e. emission), the SUN project proceeded to investigate potential hazards. The results are now published in a series of five ES&T publications by EU and US coauthors:

- 1) SUN compared antifungal efficacy and lifecycle releases of the European benchmark of wood treatment by molecularly dissolved copper amine, against two nanoenabled formulations: CuO in an acrylic paint to concentrate Cu as a barrier on the wood surface, or impregnation by micronized basic copper carbonate ( $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ ). Because of dissolving transformations, the nanoenabled impregnation does not introduce additional concern over and above that associated with the traditional impregnation. In contrast, particulate Cu released from wood coated with the CuO acrylate, which was overall less sustainable than the technological alternatives, and should not be developed into a commercial product. (Pantano et al. 2018)
- 2) On automotive plastic parts with nanomaterial pigments (organic Red254 or  $\text{Fe}_2\text{O}_3$  Red101), release by mechanical stress during/after simulated sunlight and rain degradation or leaching in food contact or secondary leaching from fragments was negligible within the experimental error. (Neubauer et al. 2017)
- 3) However, upon end-of-life incineration, plastics with mWCNT (with their catalyst impurities) increased the profiles of 16 Environmental Protection Agency (EPA) priority polycyclic aromatic hydrocarbons (PAHs) adsorbed on aerosols, resulting also in higher in vitro potency of aerosols. (Singh et al. 2017), 51: 5222-3





... Cntd/

## SUN Project Publishes Results in Five ES&T Publications

4) On the same materials and additionally plastic, epoxy or cement with mwCNT filler, we generated NEP fragments by intentional micronisation, termed „the SUN approach“.(Nowack et al. 2016) Nanomaterials were only partially exposed at the NEP fragment surface, indicating that mostly the intrinsic and extrinsic properties of the matrix drove the NEP fragment toxicity. Ecotoxicity in multiple assays was designed to explore the possible modulation of ecotoxicity by nanomaterial additives in plastics/polymer/cement, finding none. (Amorim et al. 2018)

Amorim, Mónica J. B., Sijie Lin, Karsten Schlich, José M. Navas, Andrea Brunelli, Nicole Neubauer, Klaus Vilsmeier, Anna L. Costa, Andreas Gondikas, Tian Xia, Liliana Galbis, Elena Badetti, Antonio Marcomini, Danail Hristozov, Frank von der Kammer, Kerstin Hund-Rinke, Janeck J.

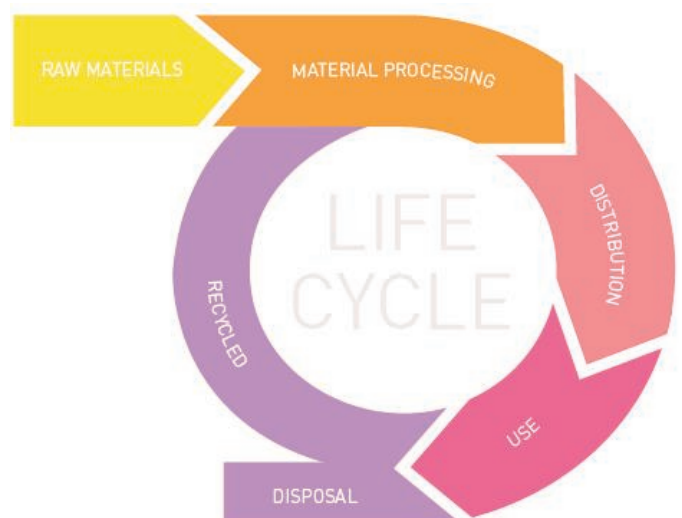
Scott-Fordsmand, André Nel, and Wendel Wohlleben. 2018. 'Environmental Impacts by Fragments Released from Nanoenabled Products: A Multiassay, Multimaterial Exploration by the SUN Approach', Environmental Science & Technology. Doi: 10.1021/acs.est.7b04122

Neubauer, Nicole, Lorette Scifo, Jana Navratilova, Andreas Gondikas, Aiga Mackevica, Daniel Borschneck, Perrine Chaurand, Vladimir Vidal, Jerome Rose, Frank von der Kammer, and Wendel Wohlleben. 2017. 'Nanoscale Coloristic Pigments: Upper Limits on Releases from Pigmented Plastic during Environmental Aging, In Food Contact, and by Leaching', Environmental Science & Technology, 51: 11669-80.

Nowack, Bernd, Alessio Boldrin, Alejandro Caballero, Steffen Foss Hansen, Fadri Gottschalk, Laura Heggelund, Michael Hennig, Aiga Mackevica, Hanna Maes, and Jana Navratilova. 2016. 'Meeting the Needs for Released Nanomaterials Required for Further Testing- The SUN Approach', Environmental Science & Technology, 50: 2747-53.

Pantano, Daniele, Nicole Neubauer, Jana Navratilova, Lorette Scifo, Chiara Civardi, Vicki Stone, Frank von der Kammer, Philipp Müller, Marcos Sanles Sobrido, Bernard Angeletti, Jerome Rose, and Wendel Wohlleben. 2018. 'Transformations of Nanoenabled Copper Formulations Govern Release, Antifungal Effectiveness, and Sustainability throughout the Wood Protection Lifecycle', Environmental Science & Technology. Doi: 10.1021/acs.est.7b04130

Singh, Dilpreet, Laura Arabella Schifman, Christa Watson-Wright, Georgios A Sotiriou, Vinka Oyanedel-Craver, Wendel Wohlleben, and Philip Demokritou. 2017. 'Nanofiller presence enhances polycyclic aromatic hydrocarbon (PAH) profile on nanoparticles released during thermal decomposition of nano-enabled thermoplastics: Potential Environmental Health Implications', Environmental Science & Technology





# NANoREG flow chart for risk assessment of nanomaterials: An animation movie

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Within the NANoREG project ([www.nanoreg.eu](http://www.nanoreg.eu)) a strategy is developed to prioritize those applications of nanomaterials that have the highest potential to cause human health effects and to identify the crucial information needed to address the nanospecific issues within risk assessment. It is a forward-looking strategy for the safety assessment of nanomaterials seeking to facilitate and accelerate the risk assessment of nanomaterials. The strategy can be used for nanomaterials that are already on the market. Elements of this approach will also be applicable to safe innovation approaches during the development of new nanomaterials in the research and development phase and is therefore suitable for different uses by innovators, regulators, industry, and risk assessors.

Details on the various phases of the flow chart and elements within that phase are described in a scientific paper 'Towards a nanospecific approach for risk assessment' by Dekkers et al. (2016, <http://www.sciencedirect.com/science/article/pii/S0273230016301581>).

Recently, a short animation movie has been developed to present the key elements of the NANoREG flow chart for a broader audience than scientists alone. This animation movie is developed by the RIVM and available at: [https://www.youtube.com/watch?v=E25AV8iom\\_o](https://www.youtube.com/watch?v=E25AV8iom_o)

RIVM FlowChart NANoREG nanospecific risk assessment strategy

RIVM FlowChart NANoREG nanospecific risk assessment strategy

RISK ASSESSMENT FOR NANOMATERIALS  
FLOW CHART

FLOW CHART

NANoREG  
RESULT REPOSITORY  
[www.nanoreg.eu](http://www.nanoreg.eu)

Details on the various phases of the flowchart can be found in the project report and publication.

0:02 / 3:11

2:50 / 3:11

National Institute for Public Health and the Environment  
Ministry of Health, Welfare and Sport

[www.rivm.nl](http://www.rivm.nl)

An RIVM production © 2017  
Committed to health and sustainability



# “A methodology on how to create a real-life relevant risk profile for a given nanomaterial”.

## Authors:

Christa Schimpel, Susanne Resch, Guillaume Flament  
David Carlander, Celina Vaquero, Izaskun Bustero  
Andreas Falk

<https://doi.org/10.1016/j.jchas.2017.06.002>

The publication is part of the research output from the H2020 projects INSPIRED, Hi-Response and NANOGENTOOLS. The proposed approach provides a hazard-, exposure and risk profile for a given nanomaterial, including:

- identification of potential exposure scenarios,
- use of qualitative and semi-quantitative tools to prioritize them,
- measurement of occupational exposure, both at lab and pilot scale, and
- introduction of the Safe-by-Design concept in the innovation and development phases of the pilot plant.

With the concept, concrete and practical guidance to industry on how to deal with environmental health and safety (EHS) issues of manufactured nanomaterials and nano-enabled products along their lifecycle is provided. Following this approach, timely insight can be acquired by innovators and regulators with the ultimate goal to strive for negligible risks and to avoid product bans.

## RESEARCH ARTICLE

# A methodology on how to create a real-life relevant risk profile for a given nanomaterial

With large amounts of nanotoxicology studies delivering contradicting results and a complex, moving regulatory framework, potential risks surrounding nanotechnology appear complex and confusing. Many researchers and workers in different sectors are dealing with nanomaterials on a day-to-day basis, and have a requirement to define their assessment/management needs. This paper describes an industry-tailored strategy for risk assessment of nanomaterials and nano-enabled products, which builds on recent research outcomes. The approach focuses on the creation of a risk profile for a given nanomaterial (e.g., determine which materials and/or process operation pose greater risk, where these risks occur in the lifecycle, and the impact of these risks on society), using state-of-the-art safety assessment approaches/tools (ECETOC TRA, Stoffenmanager Nano and ISD/TS 12901-2:2014). The developed nanosafety strategy takes into account cross-sectoral industrial needs and includes (i) Information Gathering: Identification of nanomaterials and hazards by a demand driven questionnaire and on site company visits in the context of human and ecosystem exposures, considering all companies/parties/downstream users involved along the value chain; (ii) Hazard Assessment: Collection of all relevant and available information on the intrinsic properties of the substance (e.g., peer reviewed (eco)toxicological data, material safety data sheets), as well as identification of actual recommendations and benchmark limits for the different nano-objects in the scope of this project; (iii) Exposure Assessment: Definition of industry specific and application specific exposure scenarios taking into account operational conditions and risk management measures; (iv) Risk Characterisation: Classification of the risk potential by making use of exposure estimation models (i.e., comparing estimated exposure levels with threshold levels); (v) Refined Risk Characterisation and Exposure Monitoring: Selection of individual exposure scenarios for exposure monitoring following the OECD Harmonized Tiered Approach to refine risk assessment; (vi) Risk Mitigation Strategies: Development of risk mitigation actions focusing on risk prevention.

By **Christa Schimpel, Susanne Resch, Guillaume Flament, David Carlander, Celina Vaquero, Izaskun Bustero, Andreas Falk**

## INTRODUCTION

In the last decade, nanotechnology entered the policy arena as a technology that is simultaneously threatening and promising<sup>1</sup>. The combination of size, structure and physical/chemical properties of nanomaterials (NMs) offer remarkable technological advances and innovations but may also entail

new risks for human health and the environment<sup>2-4</sup>. Thus, an appropriate management of nano related risks have been identified by the EU Commission as a vital empowering issue for the success of NMs and nanotechnologies<sup>5</sup>. One bottleneck that hinders the safe and sustainable development of nano innovations in various industrial sectors is that nano-specific legislative

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*Susanne Resch is affiliated with the BioNanoNet Forschungsgesellschaft mbH, Graz, Austria.*

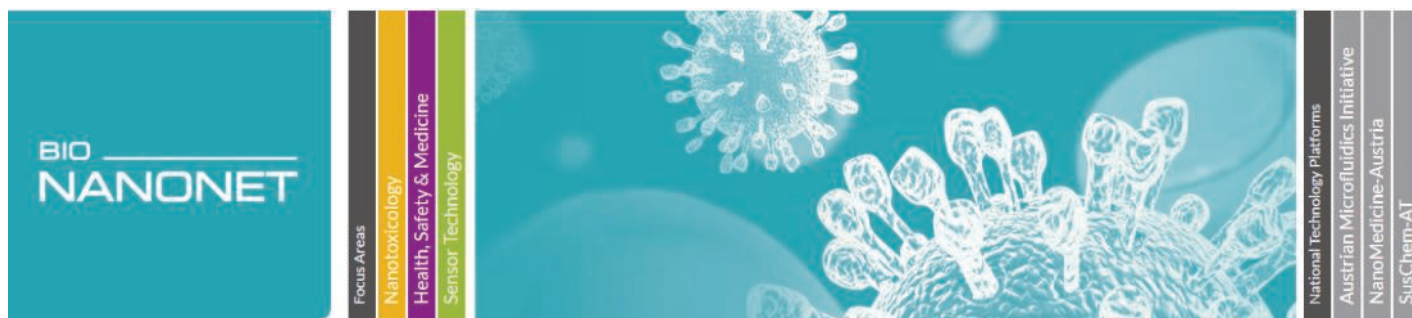
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12 © 2017 The Authors. Published by Elsevier Inc. on behalf of Division of Chemical Health and Safety of the American Chemical Society. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>). <http://dx.doi.org/10.1016/j.jchas.2017.06.002> 1871-5837



## BioNanoNet Newsletter

[https://www.bionanonet.at/images/BioNanoNet\\_News\\_2017\\_04.pdf](https://www.bionanonet.at/images/BioNanoNet_News_2017_04.pdf)

Simone Jagersbacher  
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The latest BioNanoNet-Newsletter is available for download now

Besides contributions from BioNanoNet members, reports about projects and activities, new members and an overview of interesting events, we kindly highlight the BioNanoNet member presentation within this newsletter, which presents ScienceConsult – DI Thomas Mohr KG.



# The European Union Observatory for Nanomaterials

Team KIR nano, RIVM

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[http://www.rivm.nl/en/Topics/N/Nanotechnology/RIVM\\_activities\\_related\\_to\\_nanotechnology](http://www.rivm.nl/en/Topics/N/Nanotechnology/RIVM_activities_related_to_nanotechnology)

On 14 June 2017, the European Commission launched the “European Union Observatory for Nanomaterials” (EUON). As registration is not mandatory, the EUON is limited in detailed information. Consequently, RIVM expects EUON's contribution to reducing the uncertainty regarding the safety of nanomaterials to be limited. That is the conclusion of the RIVM analysis ‘The European Union Observatory for Nanomaterials – a step forward?’

The European Commission has decided not to introduce a mandatory registry for nanomaterials. Instead, the European Union Observatory for Nanomaterials was established at the European Chemicals Agency (ECHA). The RIVM Knowledge and Information Centre on Risks of Nanotechnology (KIR-nano) has explored the consequences of this decision for the available knowledge regarding the use and safety of nanomaterials. Together with a number of other European countries, the Netherlands has asked for a (mandatory) European registration system for nanomaterials.

Via the EUON, the European Commission aims to promote transparency regarding the use and safety of nanomaterials. The EUON facilitates this by providing information about nanomaterials and their potentially associated risks to a broad public in a clear and understandable fashion. The focus thereby is on nanomaterials that are already on the EU market.

The Dutch government aims to safeguard the safety of nanomaterials with regard to humans and the environment. For that purpose, it is important to know which products contain nanomaterials and what the potential risks of these materials are for public health and the environment. The EUON contributes to this knowledge by collecting the available information at one central location. However, in addition to simply collecting information, the quality of the information is also important.

As registration of nanomaterials is not mandatory, the EUON depends upon information about nanomaterials that is already available from other sources, for example from the REACH Regulation. REACH is the European legislation to ensure the safe use of chemical substances. However, this risk assessment framework is not yet sufficiently suitable for nanomaterials. In addition, the information is limited to broad categories of products and articles, and brand names are not specified. As a result, RIVM expects that it will remain difficult for consumers, as well as others, to judge whether they are actually using a ‘nanoproduct’ and what the potential health consequences are of such use. Accordingly, even though the EUON maintains a separate web portal for consumers, it appears most relevant for experts, competent authorities, and industry.

<http://www.rivm.nl/dsresource?objectid=72410ea8-7d00-4b72-91d5-c1ff4a78c34f&type=pdf&disposition=inline>



## Risks of Nanotechnology Knowledge and Information Centre (KIR nano)

The Dutch Cabinet vision on nanotechnologies (Van Klein naar Groot, 2006) led to the establishment of the Risks of Nanotechnology Knowledge and Information Centre (KIR nano) at RIVM. KIR nano was commissioned by several of the Dutch ministries.

### Function of KIR nano

There are a great number of developments in the field of nanotechnology. In order to closely monitor the possible risks involved, a central organisation is needed to connect the various fields of research and translate this into policy. Policymakers may use the combined knowledge from KIR nano to provide them with policy direction.

## WHO guidelines on protecting workers from potential risks of manufactured nanomaterials

Rolf Packroff

BAuA - Federal Institute for Occupational Safety and Health (Germany)

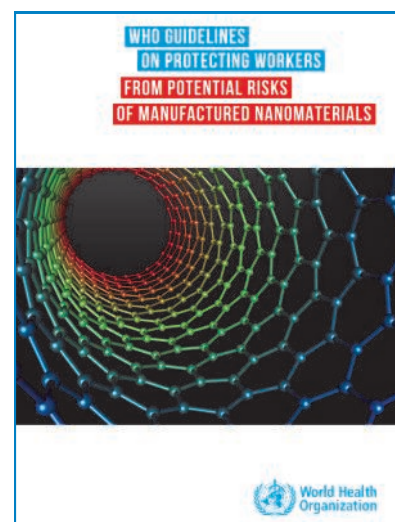
[packroff.rolf@baua.bund.de](mailto:packroff.rolf@baua.bund.de)

<http://apps.who.int/iris/bitstream/10665/259671/1/9789241550048-eng.pdf>

Recently, the World Health Organization (WHO) published an international guideline on the protection against potential health risks from manufactured nanomaterials in the workplace. It is aimed at governments and experts in the more than 180 member states of the WHO and contains recommendations on risk assessment and appropriate occupational safety measures. The guideline was drawn up according to the model of evidence-based medicine based on systematic evaluations of the scientific literature and thus broke new ground in setting international regulations for hazardous substances at the workplace.

Rolf Packroff from Baua participated in the expert group for the guideline. Important findings from the research work of the BAuA and conclusions from the German Committee for Hazardous Substances (AGS) could thus be brought in. The classification of nanomaterials into three hazard-related groups and a differentiation between rigid and non-rigid fibre dusts were the main points. These distinctions allow a differentiated definition of the necessary occupational safety measures. However, they should also enable scientifically sound risk communication and counteract the general stigmatisation of nanomaterials.

**baua:**  
Bundesanstalt für Arbeitsschutz  
und Arbeitsmedizin



## ISO publishes standard on aquatic toxicity assessment of manufactured nanomaterials in saltwater lakes

Nanotechnologies - Aquatic toxicity assessment of manufactured nanomaterials in saltwater lakes using *Artemia* sp. Nauplii

<https://www.iso.org/standard/69087.html>

Syed Ali Johari & Il Je Yu, ISO

[sajohari@gmail.com](mailto:sajohari@gmail.com)

The International Organisation for Standardisation (ISO) has published standard ISO/TS 20787:2017 "Nanotechnologies – Aquatic toxicity assessment of manufactured nanomaterials in saltwater lakes using *Artemia* sp. Nauplii".

The [standard](#) specifies a test method aiming to maximise repeatability and reliability of testing to determine whether manufactured nanomaterials are toxic to aquatic organisms, specifically *Artemia* sp. Nauplius. ISO states that ISO/TS 20787:2017 is intended to be used by ecotoxicological laboratories that are capable of hatching and culturing of *Artemia* sp. Nauplii in a simulated environment, artificial seawater, to assess effects of nanomaterials.



ISO states that the standard is applicable to manufactured nanomaterials that consist of nano-objects such as nanoparticles, nanopowders, nanofibers, nanotubes and nanowires as well as aggregates and agglomerates of such manufactured nanomaterials.

<http://www.safenano.org/news/news-articles/iso-publishes-standard-on-aquatic-toxicity-assessment-of-manufactured-nanomaterials-in-saltwater-lakes/>

Source: ISO via [Bergeson & Campbell, P.C.](#)



## Public consultation on the draft EFSA guidance on the risk assessment of the application of nanoscience and nanotechnologies in the food and feed chain: Part 1, human and animal health

Anastasios.Papadiamantis

<http://www.efsa.europa.eu/en/consultations/call/180112>

In line with EFSA's policy on openness and transparency and in order for EFSA to receive comments from the scientific community and stakeholders, EFSA's SCER Unit has launched an open consultation on the Draft EFSA Guidance on the risk assessment of the application of nanoscience and nanotechnologies in the food and feed chain. The guidance covers the relevant areas within EFSA's remit, such as novel foods, food contact materials, food and feed additives, and pesticides, and proposes a tiered approach to exposure assessment and hazard assessment for on human and animal health. This guidance was developed by the Scientific Committee upon request by EFSA (EFSA-Q-2016-00281).



The new document takes account of scientific developments that have taken place since publication of the previous guidance in 2011, particularly studies that offer new insights into exposure assessment and hazard characterisation of nanomaterials.

It also considers nanospecific considerations relating to in vivo/in vitro toxicological studies and outlines a tiered framework for toxicological testing, and proposes ways to carry out risk characterisation and uncertainty analysis.

Interested parties are invited to submit written comments **by 4 March 2018 12:00 p.m. CET**). Please use exclusively the electronic template provided to submit comments and refer to the line and page numbers. Please note that after 2 hours your working session will expire and comments submitted after that time will not be recorded and transmitted. If you would like to submit additional data to support your comments please send an email to: [SCER.PublicConsult.105@efsa.europa.eu](mailto:SCER.PublicConsult.105@efsa.europa.eu).

Please note that comments will not be considered if they:

- are submitted after the closing date and time of the public consultation;
- are not related to the contents of the document;
- contain complaints against institutions, personal accusations, irrelevant or offensive statements or material;
- are related to policy or risk management aspects, which are out of the scope of EFSA's activities.

EFSA will assess all comments from interested parties which are submitted in line with the criteria above. The comments will be further considered by EFSA and taken into consideration if found to be relevant.

All comments submitted will be published. Comments submitted by individuals in a personal capacity will be presented anonymously. Comments submitted formally on behalf of an organisation will appear with the name of the organisation.

Submit comments (deadline: 4 March 2018 12:00 p.m.)

<http://www.efsa.europa.eu/en/consultations/call/180112>

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*Food is essential to life. EFSA's scientific advice helps to protect consumers, animals and the environment from food-related risks.*



## New call to access JRC Nanobiotechnology Laboratory

<https://ec.europa.eu/jrc/en/research-facility/open-access>

Stefania Vegro, EC JRC  
[stefania.vegro@ec.europa.eu](mailto:stefania.vegro@ec.europa.eu)

Following the successful [2017 initiative](#), the European Commission's [Joint Research Centre](#) (JRC) has opened a [new call](#) to access the [JRC Nanobiotechnology Laboratory](#) aiming to spread scientific knowledge, boost competitiveness and help to bridge the gap between research and industry. The results will also feed into JRC's mission to support EU policymaking. Access is offered to researchers and scientists from EU Member States, candidate countries and countries associated to the [EU Research Programme Horizon 2020](#). Open until 13 April 2018, the call follows the relevance-driven mode and addresses mainly people working in universities and research institutions, as well as [small and medium enterprises \(SMEs\)](#), and more in general public and private sectors.

Located in [Italy](#) (JRC Ispra site), the JRC Nanobiotechnology Laboratory features state-of-the-art equipped facilities designed to foster interdisciplinary studies. A special emphasis lies on characterisation of nanomaterials, nanomedicines, advanced materials and their interactions with biological systems, as well as on the detection, identification and characterisation of nanomaterials in food and consumer products.

On the webpage [Open access to JRC Research Infrastructures](#) you can find not only the [new Nanobiotechnology call](#) but also other JRC calls still open (e.g. nuclear facilities).

All relevant information here: <https://ec.europa.eu/jrc/en/research-facility/open-access>



Image: The JRC Nanobiotechnology Laboratory (EC JRC Ispra site, Italy)

Image Credit: @EU 2018

# 3rd Italian-Swedish Workshop on Health Impacts of NanoBioMaterials

Torino, 22nd -23rd March 2018

BIORIMA: [www.biorima.eu](http://www.biorima.eu)

Lisa Bregoli, Warrant Group: [lisa.bregoli@warrantgroup.it](mailto:lisa.bregoli@warrantgroup.it)

The 3rd Italian-Swedish Workshop on Health Impacts of NanoBioMaterials – from safety assessment to biomedical uses – will be held in Torino from 22 to 23 of March 2018, in the framework of the BIORIMA project. The Workshop follows the previous successful meetings on Health Impacts of Nanomaterials (Rome, 2010 and Stockholm, 2012). The scientific aim of this 2-day workshop is to provide up-to-date information on material characteristics, their application and potential adverse health effects mainly dealing with (nano)biomaterials (NBM), as well to highlight current and future biomedical applications including targeted drug delivery systems and regenerative medicine.

The main lectures of the workshop, given by Italian and Swedish leading scientists are intended to give the International audience a comprehensive and critical overview of the state-of-the-art, integrated by current data based on the personal experience of the speakers in each respective field. The goal is also to reinforce a platform for common initiatives of Italian and Swedish researchers in the field of nanoscience and biomaterial safety and health and also between these groups and industry. The workshop will also feature a series of short presentations by selected participants including junior scientists.

The event is organized within the H2020 Project BIORIMA, which is devoted to the comprehensive assessment of hazards and benefits from BNM ([www.biorima.eu](http://www.biorima.eu)), with a runtime of 4 years and 41 consortium partners. The project aims to develop an integrated risk management framework for nano-biomaterials used in advanced therapeutic medicinal products and medical devices. We expect an exciting discussion of the treated themes, considering the presence, as invited attendants, of members of the industry, regulatory agencies, and worker's compensation authorities.

## 1st BIORIMA Training School - Risk Assessment and Risk Management of Nano-Biomaterials in Medical Applications

Venice, 16-20 April 2018

BIORIMA: [www.biorima.eu](http://www.biorima.eu)

Danail Hristozov, GreenDecision Srl: [danail.hristozov@greendecision.eu](mailto:danail.hristozov@greendecision.eu)

We warmly invite you to Venice this April for the 1st BIORIMA Training school


### About the School

Hosted and co-organized by GreenDecision, in collaboration with the Institute of Occupational Medicine, BioNanoNet, Warrant Group and Ca'Foscari University of Venice, the first edition of a series of Training Schools organized within the EU funded Horizon 2020 BIORIMA project, will take place in the historic center of Venice, Italy on 16 – 20 April 2018. The School aims to transfer the state of the art knowledge on a variety of topics from key experts to the new generation of nano-environmental, health and safety, and biomedicine professionals.

### Topics

- The Training School will cover 4 main topics:
- Advanced Nano-Biomaterials
- Fate & Exposure Scenarios
- Hazard to Human Health & Environment
- Risk Assessment & Risk Management

**Web Link:** <http://www.greendecision.eu/wp/1st-biorima-training-school/>



**SAVE THE DATES: 16-20 April 2018**

**1st BIORIMA Training School**  
Risk Assessment and Risk Management of Nano-Biomaterials in Medical Applications

|  |  |
|--|--|
| <p><b>Who should attend?</b></p> <ul style="list-style-type: none"> <li>➤ Early stage researchers</li> <li>➤ PhD students and Post Docs</li> <li>➤ Senior researchers</li> <li>➤ Industry</li> <li>➤ Environmental Agencies</li> <li>➤ Medical Personnel</li> <li>➤ Anyone interested in Safe Nanotechnology, Risk Assessment and Nano Medicine</li> </ul> | <p><b>About the School</b><br/>Hosted and co-organized by Green Decision in collaboration with the Institute of Occupational Medicine, BioNanoNet, Warrant Group, and Ca'Foscari University of Venice, the first edition of a series of Training Schools organized within the EU funded Horizon 2020 BIORIMA project, will take place in the historic center of Venice, Italy on 16 – 20 April 2018. The School aims to transfer the state of the art knowledge on a variety of topics from key experts to the new generation of nano-environmental, health and safety, and biomedicine professionals.</p> <p><b>Topics</b><br/>The Training School will cover 4 main topics:</p> <ul style="list-style-type: none"> <li>✓ Advanced Nano-Biomaterials</li> <li>✓ Fate &amp; Exposure Scenarios</li> <li>✓ Hazard to Human Health &amp; Environment</li> <li>✓ Risk Assessment &amp; Risk Management</li> </ul> <p><b>Benefits from Attending the School</b></p> <ul style="list-style-type: none"> <li>• Learn the latest trends in safe biomedicine gaining an in-depth understanding of the above-mentioned key topics.</li> <li>• Engage in a dialogue with peers and key experts.</li> <li>• Benefit from a variety of additional networking opportunities such as boat trip in the Venetian Lagoon and a social dinner in the historical center of amazing Venice.</li> </ul> |
|--|--|

Venue:  
The entire programme will take place in the historic Ca' Foscari Palace.

**Tentative Agenda**  
16 – 20 April Training Days  
17 April Boat Trip  
18/19 April Social Dinner

For more information visit  
[Biorimaschool.greendecision.eu](http://Biorimaschool.greendecision.eu)

Organizers:  
GreenDecision | IOM | NANONET | WARRANT GROUP

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 741874.



# NanoStreeM Training Workshop

## Governance of emerging nano-risk in semiconductor industry

April 26, 2018, Brussels

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

Dimiter Prodanov, IMEC

[dimiter.prodanov@imec.be](mailto:dimiter.prodanov@imec.be)



The workshop will address the key topic of risk governance for nanomaterials within the semi-conductor industry. It aims at bringing together regulators, policy makers, the growing risk governance community for nanomaterials plus the industries that will apply and build business based on the risk governance methods.

The meeting will present how and where nanomaterials are used in the semiconductor industry based on the findings of the NanoStreeM project. The project caLIBRAte will present nanomaterials risk governance frameworks which could be applied within the semi-conductor industry. The workshop will conclude with a panel discussion on the steps necessary to further enable use of nanomaterials throughout the industry and appropriately govern the emergent risks.

The meeting outcome will identify the challenges and regulatory issues in semi-conductor industry and how risk governance tools for nanomaterials can support effective business operation.

### Risk governance tools for nanomaterials

Engineered Nanomaterials are used in a variety of applications: from cosmetics and paints, to sportswear and semiconductor chips. While for chemicals there are established regulatory frameworks dealing with the risk for the consumers, workers and the environment, this is not the case for nanomaterials. The reason is precisely the purpose for nanomaterial use – the properties of matter at the nanoscale change and become dependent on the particle size and shape. In order to mitigate the relative lack of information about such novel materials, the European Commission has launched the concept of “safe-by-design”, which is tested in a variety of ways in different funded projects. Semiconductor manufacturing employs top-down high precision approaches offering nanometer resolution of detail. This is achieved by following a rigorous approach to process quality and worker safety. This setting can be used as a natural test bed for the risk assessment approaches developed as manifestations of the “safe-by-design” concept. Identifying methodologies for risk assessment and governance of situations where risk could emerge from nanomaterial use is part of the work undergoing the H2020 project NanoStreeM. The H2020 project caLIBRAte addresses risk governance in nanomaterials throughout their lifecycle, creating a ‘system of systems’ to align risk governance models for use across research and industry in the development of novel materials.

Web Link:<http://www.nanostreem.eu/events/governance-event>

**Nanoelectronics** relies on multiple semiconductor processes resulting in patterning of macroscopic objects (silicon wafers) at nanoscale level. Advanced technologies developed by semiconductor manufacturers offer unprecedented control of the properties of the finished product in large volumes. The rapid pace of progress in the semiconductor manufacturing dictated by the Moore’s economic law also introduces a variety of novel nano-structured materials having poorly understood hazardous properties.

The NanoStreeM consortium has taken up the challenge in defining a road map of Safety of nanomaterials in nanoelectronics where we identify the existing gaps in our knowledge and a number of recommendations for their mitigation.

## NanoFASE Organizes Full-Day Scientific Session at SETAC Rome, 13th—17th May 2018

Session 3.24 @SETAC Europe 2018:

**"The environment as a reactor determining fate and toxicity of nanomaterials"** is co-chaired by Susana Loureiro (UoA), C.A.M. van Gestel (Vu), Iseult Lynch (UoB), and Claus Svendsen (NERC).

The H2020 project NanoFASE is working to drive community acceptance that pristine particles don't exist in the environment and thus that environmental testing of "pristine particles only" is not informative of real effects. Thus, NanoFASE is developing a deep understanding of the types and timescales of environmental transformations of nanomaterials, with the goal to reduce the enormous diversity of pristine nanomaterials to a simpler sub-set of transformed particles that are likely to be the dominant form in each environmental compartment.

To this end, NanoFASE is built around the **"reactor"** concept, whereby each environmental compartment (i.e. air, water, soil, wastewater and organisms) is considered to act as a reactor that *transforms* the nanoparticles it receives, through interactions with the biomolecules and other constituents of that compartment, and then emits the transformed nanoparticles to the next compartment. Thus, nanoparticles from consumer products such as textiles or cosmetics are released to wastewater, whereby they are transformed (reacted) through chemical, physical, biological and biomolecule interactions, often resulting in sulfidation and acquisition of a biomolecule corona, before being released into the effluent water and joining the freshwater compartment.

To build awareness of the reactor concept, and the nanoparticle forms that are relevant for ecotoxicity testing in the different environmental compartments, several **NanoFASE partners** are organising a session at SETAC Europe 2018 to showcase progress in addressing the theme of the environment as a reactor that transforms nanoparticles and thus determines their fate and behaviour. The session take place across the full day of Monday 14 May (TBC by SETAC), with 12 platform (oral) presentations and a large set of poster presentations. The morning will showcase research on the environment as a reactor that drives / modulates the **toxicity** of nanoparticles including on reproduction of *Daphnia magna*, uptake and elimination in freshwater benthic organisms, bioaccumulation in fish and food chain effects, while the afternoon session will highlight research on the environment as a reactor that affects nanoparticle **fate** in the environment including mobilisation of nanoparticles in soil column by earthworms' bioturbation, heteroaggregation processes, attachment efficiency determination, long-term transformations in soil, and transformations during sewage sludge combustion.

We extend a warm invitation to all interested stakeholders to join us, hoping to see you there for this exciting programme of talks and posters, and inviting you to take part in the fruitful discussions and collaborative opportunities that will arise.

Please consider [registering](#) for our Monday 14 May (16:30-18:30) free Hands-On Stakeholder Consultation at SETAC.

We will take our stakeholders from the regulatory, industry/consultants, academic and standardization communities through the on-line Clickable [Exposure Assessment Framework](#) derived from NanoFASE work and uptake your user feedback!



Susana Loureiro (UoA)





# NANOSTRUC 2018

## The 4th International Conference on Structural Nano Composites Recent Advances in Materials Through Nanoscience and Nanotechnology

23-24 May 2018

HTW Berlin University Of Applied Sciences, Berlin Conference

<http://www.nanostruc.info>

James Njuguna

Robert Gordon University, Aberdeen, UK

[j.njuguna@rgu.ac.uk](mailto:j.njuguna@rgu.ac.uk)

NANOSTRUC2018 brings together an international community of experts in Berlin (Germany) on 23-24 May 2017. The aim is for these stakeholders to discuss the state-of-the-art, new research results, perspectives of future developments, and innovative applications relevant to structural materials, engineering structures, nanocomposites, modelling and simulations, and their related application areas.

The recent developments in understanding and improved manufacturing techniques of nanoparticles have rapidly introduced engineering nanomaterials across the commercial industry. Manufacturers can now disperse nanoparticulate nanotubes, metals, layered silicates, oxides and other nanomaterials with polymers, metals and ceramics to optimize the composite's properties.

This in turn provides color/transparency, conductivity, flame retardancy, barrier properties, magnetic properties and anticorrosive properties, as well as tensile strength, modulus and heat distortion temperature. These composites offer users significantly enhanced properties compared to conventional materials. The ability to incorporate nanofillers within polymers has permitted extensive research and progress in targeting specific material properties with great control and precision.

# NANOSTRUC

### CARBON, GRAPHENE & LAYERED SILICATES

Up date on most recent advances in nanomaterials applications and products.

### FUNCTIONAL MATERIALS

Recent development in functional nanomaterials

### AUTOMOTIVE AND AEROSPACE APPLICATIONS

We analyze everything from supply chain management to employee compensation.

### ACADEMIC & INDUSTRY BEST PRACTICES

Nanoscale to macroscale modelling





# SaferNano Design & Law Summer School

Camille de Garidel-Thoron,  
Labex SERENADE  
[cgaridel@cerege.fr](mailto:cgaridel@cerege.fr)

SAFERNANO DESIGN & LAW  
26 May-4 June 2018  
ESI, Archamps Technopole (France),  
15 mins. from Geneva.

Limited places  
Applications via <http://www.safernanodesign.eu>  
from 1st February to 15th April 2018



## Assessing the risk of nanomaterials on environmental and human health

Engineered nanomaterials can today be found in at least 1800 commercially available products. With their unique properties and potential to significantly reduce dependence on extractable raw materials, the possible benefits to industry, and society as a whole, are enormous. However, robust information on the risks associated with extensive use of nanoscale particles and devices remains inadequate, and the gap between data generation and the ability of agencies to perform assessment continues to grow. This situation is compounded by the diversity of engineered nanomaterials in both their composition and the nature of the potential hazards they present.

## Promoting a pluridisciplinary “safer-by-design” approach

SaferNano prepares tomorrow’s researchers, industrialists, entrepreneurs and regulators to take on the complex challenges posed by nanotechnology. Using a “safer-by-design” approach, involving the development of new methods of life-cycle assessment, SaferNano introduces highly motivated scientists and lawyers, nearing or at the end of their university education, to working in a pluridisciplinary and international environment. The school offers them a transformational opportunity to broaden their skills-sets in a range of fields including advanced research strategies, sustainable business planning, ethics and regulatory law.

## An engaging and intensive programme

The school’s intensive programme is constructed around a series of industrial and societal case studies, (silver nanowire, gender imbalance in exposure levels). The curriculum includes a range of core presentations delivered by world-class experts, followed by practical workshops, laboratory and computer sessions. Students work in pluridisciplinary groups on innovation projects which involve merging design thinking, entrepreneurship and legal and regulatory issues into a business plan. At the end, participants pitch their innovation ideas to a panel of experts from industry, academia, start-ups and business incubators.

By attending SaferNano, participants will acquire thorough understanding of current and future best practice in risk assessment, of the challenges and opportunities inherent to marketing nano-enabled products and of current and future public-health law in key nations and at the international level.

Project coordinator  
Philippe SABATIER, Université Grenoble-Alpes

Contact email  
[biohc@esi-archamps.eu](mailto:biohc@esi-archamps.eu)



# NanoFASE Hands-on Stakeholder Consultation

14 May 2018  
Rome, Italy



**Help shape the NanoFASE Framework!** The NanoFASE integrated environmental Exposure Assessment Framework applicable to engineered nanomaterials will enable understanding and prediction on the "exposure" side of the risk assessment equation (Risk = Exposure x Hazard).

If you are attending SETAC Rome – SETAC Europe 28<sup>th</sup> Annual Meeting, you are warmly invited to learn about concepts and approaches underpinning our Exposure Assessment Framework and help us tailor it to be even more suited to your specific needs in the **Regulatory, Industrial, Research or Standardization sectors**. *Our approach encompasses value chain pathway analysis, transport and transformation processes throughout air, soil, freshwater, marine and biotic environmental compartments. Exemplar particles may include metal and metal oxide materials used in products such as antifouling paints, textiles, photocatalytic coatings for roads, inks, waste water treatment additives, and ground water and soil remediation products.*

Monday 14 May 2018 (16:30-18:30, with refreshments), we'll gather a group limited to 24 persons, balanced across sectors, for case-based small group discussion led by coordinator Claus Svendsen (NERC) and others. This is a late-afternoon free workshop located within the SETAC conference centre. We also urge interested parties to look into our full-day scientific session 3.24 "The environment as a reactor determining fate and toxicity of nanomaterials" [see page 24](#)

[Register here](#) by 1 April 2018.

Final confirmation regarding your participation will be provided by 9 April 2018.

Wait-listed persons will be invited to a webinar TBA.

Contact: Ms. G. Balachandran [gbalachandran@eu-vri.eu](mailto:gbalachandran@eu-vri.eu)



## “Nanotechnology- The World Behind Innovation”

### International Conference on Nanotechnology and Nano-engineering

Paris, France  
July 16-18, 2018.

Robin Brown  
Meetings International Pte Ltd  
[nanotechnology@annualmeet.org](mailto:nanotechnology@annualmeet.org)

The conference throws light on thought-provoking topics and recent research in the field of Nanotechnology and Nanoengineering like Green Nanotechnology, Nanoengineering, Graphenes and 2D Materials, Nanobiotechnology, Nanoelectronics, Nanomechanics, Nanophonetics, Cancer Nanotechnology, NanoPharmaceuticals, Nanotoxicity and many more. The organizing committee is gearing up for an exciting and informative conference program including plenary lectures, symposia, workshops on a variety of topics, poster presentations and various programs for participants from all over the world. We invite you to join Nanotechnology 2018 Conference, where you are sure to have a meaningful experience with scholars from around the world

<https://www.meetingsint.com/pharma-conferences/nanomedicine-nanotechnology>



## International Conference on Functional Nanomaterials and NanoDevices 3-5 September 2018, Vienna, Austria

<http://www.nanomat2018.com>

European Nanoscience and Nanotechnology Association  
[abstracts2018@europenanoscience.org](mailto:abstracts2018@europenanoscience.org)

The International Functional Nanomaterials and Nanodevice Conference 2018 aims to bring together leading scientists, researchers, engineers, and technology developers in nanotechnology to exchange information on their latest research progress and innovation.

This Conference will include a series of symposia focused on four main areas which are: Functional Nanomaterials Synthesis and Characterization; Devices for Energy Storage and Energy Conversion; Nanobiotechnologies and Nanodevices; and Nanotechnology for Environmental Studies & Safety Issues.


**Symposia**

- ▶ Energy Conversion and Storage Materials
- ▶ Catalysis for Clean Energy and Chemical Production
- ▶ Synthesis and Characterization of Nanomaterials
- ▶ Nanobiotechnologies


**Plenary Speakers**



**Prof. Khalil Amine**  
Stanford University, USA



**Prof. Ho Ghim Wei**  
National University of Singapore, Singapore



**Prof. Oliver G. Schmidt**  
Leibniz Institute for Solid State and Materials Research Dresden, Germany



**Prof. Shi-Zhang Qiao**  
University of Adelaide, Australia

Early registration deadline: March 30 2018  
Abstract submission deadline: June 1, 2018  
Registration deadline: June 15, 2018



The event is organized by European Nanoscience and Nanotechnology Association, EU in cooperation with Technische Universität Wien, Austria  
[www.nanomat2018.com](http://www.nanomat2018.com)



## 5th World Congress on Microbial Biotechnology September 17-18, 2018 in Lisbon, Portugal

<http://microbialbiotechnology.cmesociety.com>  
[microbialbiotechnology@pulsusmeetings.org](mailto:microbialbiotechnology@pulsusmeetings.org)

PULSUS Conferences invites all the participants from all over the world to attend “5th World Congress on Microbial Biotechnology” under the theme “Microbial Biotechnology” during . This includes prompt keynote presentations, Oral talks, Poster presentations and Exhibitions. Microbial Biotechnology 2018 is a global platform for microbiologists, biotechnologists, researchers, doctors, scientists, faculties, students and other subject matter experts, to discuss about microbial biotechnology.

Microbial Biotechnology can be defined as one of the aspect of biotechnology which involves the use of the microorganisms or their products. Microbial biotechnology is also referred to as industrial microbiology because of its new discoveries made in the field of genetic engineering. Industrial microbiology was initially established for the alcoholic fermentation process to produce wine and beer, and later it was used for microbial production of antibiotics, enzymes, butanol, citric acids etc. Recent research has shown that microbial biotechnology plays major important role in improved vaccine production and disease-diagnostic tools.



## 22nd International Conference on Advanced Materials & Nanotechnology September 19-21, 2018, Tokyo, Japan.

<https://advancedmaterials.conferenceseries.com/registration.php>  
[advancedmaterials@materialsconferences.org](mailto:advancedmaterials@materialsconferences.org)

The Organizing Committee invites participants from all over the globe to take part in this annual conference with the theme “Exploring the Possibilities in the Field of Advanced Materials and Nanotechnology”. Advanced Materials 2018 aims at sharing new ideas and new technologies amongst the professionals, industrialists and students from research areas of Advanced Materials and Nanotechnology to share their recent innovations and applications and indulge in interactive discussions and technical sessions at the event. The Conference will also have a space for companies and/or institutions to present their services, products, innovations and research results.

Advanced Materials 2018 and Nanotechnology involves the tracks like Advanced Materials and Functional Devices, Engineering Materials, Composite Materials, Magnetism & Multiferroism, Optical materials and plasmonics, Energy and Harvesting Materials, Nanotechnology-Basics to applications, Nanopore science, Nanomedicine, Bio Nanotechnologies, Carbon nanostructures and graphene, Spintronics, Nanoparticle synthesis and applications.



## 2018 IEEE 13th Nano Materials & Devices Conference (NMDC 2018)

14-17 October 2018  
Portland, Oregon, USA

The 2018 IEEE 13th Nano Materials & Devices Conference (NMDC 2018) will be held in Portland, Oregon, USA on 14-17 October, 2018 at the Embassy Suites Downtown hotel. NMDC is an annual conference sponsored by the IEEE Nanotechnology Council (NTC).

NMDC aims to develop critical assessment of existing work and future directions in nanotechnology research including nanomaterials and fabrications, nanoelectronics, nanophotonics, devices, and integration.

This conference will bring together key researchers from every sector in the nanotechnology research field, with a special focus on materials and devices.

This year, NMDC 2018 is soliciting papers and sessions on Materials and Devices for heterogeneous nano/biomedical systems in these areas:

- Nanomaterials & nanodevices
- Properties, Fabrication and applications of nanomaterials, nanosensors and nanomagnetics
- Special Applications
- Nanotechnology, Nanostructures and Nanosystems
- Modeling and simulation of nano-materials, nanostructures and nanodevices
- Emerging topics related to nanomaterials, nanodevices and nanostructures
- Education in nanotechnology

We sincerely look forward to your participation in NMDC2018!

<http://sites.ieee.org/nmdc/nmdc-2018/>



# 6th International Conference nanoSAFE 2018

5-9 November 2018

<http://www.nanosafe.org/>

Simon Clavaguera, CEA

[simon.clavaguera@cea.fr](mailto:simon.clavaguera@cea.fr)

We are pleased to announce the 6th International Conference NanoSafe in France on 5-9 November 2018.

Organized every two years in Grenoble since 2008, NanoSafe conference is intended for sharing latest research results on health and safety issues related to nanomaterials and beyond for a socially responsible approach.



## Engage with the NanoSafety Cluster...

**Do you have any news ♦**

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- ♦ jobs ♦ proposals ♦ partnership
- opportunities ♦ that you want the
- nanosafety community to know about?

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NSC Compendium

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