Welcome to the NSC interim bulletin for Autumn 2017

Due to popular demand (and a number of news items that really can't wait for the next issue) this interim NSC Autumn Bulletin has been published to let you know about some important updates, news and events of significance to the NanoSafety community.

The issue launches with a report on the NSC Steering Group Face-to-Face Meeting & ECHA Data Harmonisation Workshop, which took place earlier this month in Brussels. increase the NSC community's ability to pool data, enhance data sharing and collaborations within the NSC, and facilitate future data import into ECHA's EUON. The EUON is a new initiative, funded by the EU Commission and hosted and maintained by the European Chemicals Agency (ECHA). Its goal is to increase the transparency of nanomaterials on the EU market by ensuring that all perspectives are taken into account.

In the project update, OpenRiskNet highlights its case studies based on project partners' experience in NanoEHS projects and activities within NSC working groups. Meanwhile, there is a final update from the NanoDefine Project on its Electrospray Deposition System followed by an overview of the Nano Safe Leather project which looks at the risks of Ag/TiO2NMs in the leather footwear industry.

Forthcoming events, including OpenTox 2017 (21st—23rd November), project webinars, and conferences are the focus of the next section—registration and submission deadlines are imminent for some of these, so make sure you don't miss out.

Later in this bulletin there is an announcement of a PhD Research opportunity at the University of Manchester "Investigating the impact of graphene and 2D materials on the central nervous system": the deadline for applications is **November 16th.**

Finally, on behalf of WG7 Dissemination, thank you for your contributions and keep them coming!

Kind regards

Lesley

WG7 Dissemination

Contents:

Have your say and stay in touch:

Contribute to the NSC Newsletter here:
http://www.nanosafetycluster.eu/news/submit-news.html

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https://www.linkedin.com/groups/7471509

NSC Steering Group Face-to-Face Meeting & ECHA Data Harmonisation Workshop

The EU NanoSafety Cluster face-to-face meeting took place on Wednesday October 18th at the University of Birmingham Brussels Office followed by a workshop on Data Harmonisation, co-organised with the European Chemicals Agency on October 19th.

NSC Face-to-Face Meeting & ECHA Data Harmonisation Workshop

The overall aim of the workshop was to bring together EU coordinators of recently completed, ongoing and newly starting projects and other interested parties, including ECHA, to discuss accessibility to, and curation of, nanosafety data. A key objective of the workshop was to increase the NSC community's ability to pool data, enhance data sharing and collaborations within the NSC, and facilitate future data import into ECHA's European Union Observatory for Nanomaterials (EUON).

Day one

Following a warm welcome and an update on the status of the NSC by its Chair, Eva Valsami-Jones, Flemming Cassee then took the platform to outline the responses to our survey of the action plan for 2017-2020, and the projected next steps. The proposed NSC Task Forces then delivered incisive presentations on their specialist areas of nanoTiO_2 (Damjana Drobne); a definition of Safe-by-Design (Claire Skentelbery); Sustainability (Thomas Exner); Data exposure and management (Wouter Fransman); and ENM/Protein membrane interactions (Andrew Nelson). Andrea Haase presented an update on the US-EU nanoinformatics roadmap.

The afternoon of the first day began with a short overview of the forthcoming calls, focussing on the nanoinformatics and related topics from George Katalagarianakis. Project representatives then delivered brief presentations on strategies (past, present, future) for data capture, storage and archiving and data formats. The following projects provided valuable input:

Completed projects—Legacy	Ongoing projects—Plans	Newly started projects—Plans
• NanoMILE (Iseult Lynch) • NanoSolutions (Peter Ritchie) • Bioinformatics (Roland Grafström) • SUN (Danail Hristozov) • GuideNano (Soco Vázquez-Campos) • eNanoMapper (Thomas Exner) • NANoREG (Thomas Exner)	• OpenRiskNet (Thomas Exner) • ACEnano (Thomas Exner) • NANOREG2 (Nina Jeliazkova) • CaLIBRAte (Martine Bakker) • HISENTS (TBC) • EC4SafeNano (Anthony Bochan) • NECOMADA (Neville Slack) • EU-US Data Harmonisation initiative: CEINT NanoInformatics Knowledge Commons (Camille de Garidel) • NanoFASE (A. Papadiamantis)	• NanoCommons (Iseult Lynch) • GRACIOUS (Danail Hristozov, Nina Jeliazkova) • PATROLS (Peter Ritchie)

The day concluded with open discussions that enabled participants to identify and understand what barriers may exist in data harmonisation, leading to a consensus proposal summarised by the NSC Coordination Team.

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Day two

After a work-intensive but successful first day, Day 2 began with an introduction of the consensus view from the first day from Iseult Lynch, followed by a presentation delivered by Abdel Sumrein, ECHA, on areas of potential collaboration between the NSC and the EUON and what was expected and needed for the EUON. This lynchpin presentation highlighted the general aims and future of the observatory, and how the EUON plans to use data from research projects. The presentation also looked at Nanomaterials registration and description in a regulatory context. This provided a springboard for the subsequent breakout sessions, which were designed to discuss the main databases currently available and how their data can be harmonised across database capture systems (including consideration of SOPs), as well as database ontology harmonisation and requirements for transfer to the EUON. This provided the bases for the subsequent roundtable group discussions regarding data formats, opportunities and difficulties in data harmonisation, which highlighted that significant progress is still needed, specifically in terms of data curation, ensuring data quality and completeness is still needed, with much of this currently being done retrospectively by running projects wanting to re-use datasets from previous projects, which is clearly an unsustainable approach.

The detailed recommendations and next steps for how the NSC can best support EUON are still being finalised, and a full report from the meeting (along with the presentations) will be available via the NSC website in the coming weeks, with a link in the next NSC newsletter, so stay tuned for more.

The European Union Observatory for Nanomaterials

The EUON is a new initiative and funded by the EU Commission. It will grow over the years to come as it expands the content of the platform further. Everyone will have an important role to play in this as it can only achieve the ambitious goal of increasing the transparency of nanomaterials on the EU market by ensuring that all perspectives are taken into account.

Image credit: https://euon.echa.europa.eu/

EUON is hosted and maintained by the European Chemicals Agency (ECHA).

NanoDefine successfully completed!

By Rudolf Reuther
rudolf.reuther@enas-online.com

As one of the final EU FP7 projects, and born out of the need to support the implementation of the EC Recommendation for a definition of nanomaterial (2011/696/EU), NanoDefine has delivered the results it promised during 4 years of intensive research. The comprehensive testing, evaluation and validation of the performance of key particle-size measurement techniques resulted in a novel 2-tiered approach that includes, (1) rapid and cost-effective screening methods, such as Analytical Centrifugation (AC), Particle Tracking Analysis (PTA), Dynamic Light Scattering (DLS), Electric Mobility Spectroscopy (SMPS), miniTEM, single-particle ICP-MS and BET (VSSA), and (2) more sophisticated confirmatory methods, such as Electron Microscopy and Asymmetric flow field-flow fractionation (AF4) Multi Angle Light Scattering (MALS) ICP-MS, that help to overcome the analytical challenge associated with the implementation of the new EU definition, by identifying and assessing nanomaterials in complex real-world samples, such as substances and products.

One central outcome of the NanoDefine project was the design of a user-friendly decision-support flow scheme with a method manual developed as the "NanoDefiner" e-Tool that integrates and implements the developed methodology to safely guide potential end-users, such as manufacturing industries, regulatory bodies or enforcement laboratories, to find the most appropriate analytical route for material classification across relevant policy areas, including chemicals (REACH), food, cosmetics, biocides and product labeling, according to the EC definition.

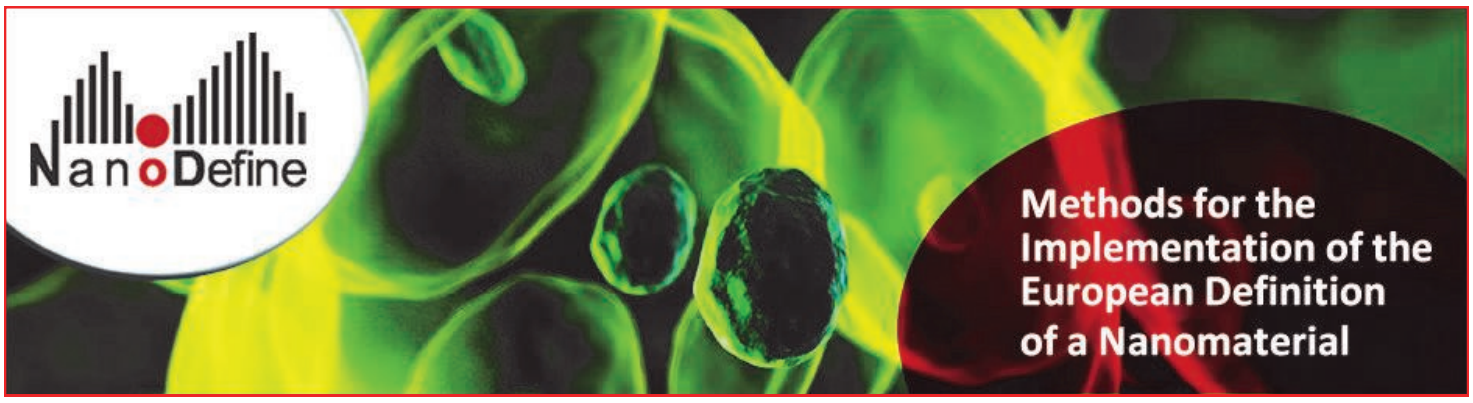
The analytical tools developed and their practical applicability to real-world samples has been recently demonstrated to main stakeholders at a final outreach event in Brussels (18-19 September 2017) and at a more industry-focused workshop in Frankfurt (24 October 2017) (presentations from these meetings are available here). The hands-on demonstrations and the new technical know-how produced for accurate particle size measurement attracted many practitioners from small and big businesses, national and international authorities, from contract labs or other relevant projects, keen to apply and adapt the new NanoDefine measurement strategy, in particular the "NanoDefiner" e-Tool, into their analytical portfolio to comply with the regulatory requirements derived from the EC recommendation.

By providing a panel of well-defined reference materials, validated standard operation procedures (SOPs) for sample treatment and size measurement, including particle counting, fractionating, spectroscopic and imaging techniques (auto-EM toolbox), as well as by new measurement software (e.g. for conversion of mass into number based size distribution), it is now feasible to reliably determine the size of particles of different shapes, coatings and in various complex media and final products, such as cosmetics and food, having one or more external dimensions in the size range 1nm – 100 nm. Case studies using reference materials as well as widely used industrial substances and products, such as kaolin, $CaCO_3$, sunscreen, zinc and iron oxide, and comprehensive in-house and inter-laboratory validation studies proved the practical applicability of the NanoDefine approach to real-world samples.

However, implementation of the EC recommendation is still challenging despite the step-changes achieved by NanoDefine, as there is no single universally applicable measurement method available and also questions, like how to define constituent particles versus aggregates/agglomerate, or how to tackle mass based particle size distribution in complex products, still remain to be solved.

Most results achieved by NanoDefine have been or will be published in peer-reviewed journals, and can be also accessed at www.nanodefine.eu.

Image: The NanoDefine Project Team—Ispra 2016



Electrospray Deposition System: assessment of the performance of the device with commercial nanoparticles at different polarity of the high voltage source

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Silvia López - slopez@ioner.net

ES-DEPO, the Electrospray Deposition System, developed by RAMEM under the aegis of the NanoDefine project with the aim of evolving new methods of sample preparation for electron microscopy is obtaining promising results. This equipment, based on the electro-hydrodynamic atomization technology, commonly known as electrospray, is an instrument to generate ions and charged nanoparticles 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.

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 between the NPs, and maximizing the collection. When analyzing NP, the dispersions are deposited in the EM grids using the "drop on grid" method and solvents are evaporated. However, the evaporation of the solvent to leave the dry NPs 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.

The ES-DEPO has already been evaluated with particles bigger than 20 nm obtaining satisfactory results (Mielke et al., 2017). This evaluation has recently been complemented in the lower range of the nanoscale using different commercial nanoparticle suspensions of 5 and 6 nm in diameter. These suspensions are water based, which complicates obtaining the stable cone-jet electrospray mode, due to the high surface tension of the water compared to other solvents.

The nanoparticles used are functionalized to maintain the colloidal stability in the solution by reducing substances which confer a negative charge. Positive-polarity electrospray positively charges the aerosolized particles. To test the eventual effect of the positive high voltage application on the stability of the particles in suspension, the negative polarity has been used.

To test the different effect of the positive and negative polarity of the electrospray on the aerolisation, deposition and deagglomeration of the NPs, the ES-DEPO system, applying positive voltage to electrospray and negative voltage has been used. On the other hand, the traditional "drop on grid" method has been used, which consists of letting a drop, as small as possible, through a needle attached to a syringe containing the sample, and leave it under a fume hood, safe from external contamination, until the liquid phase of the sample has completely evaporated.

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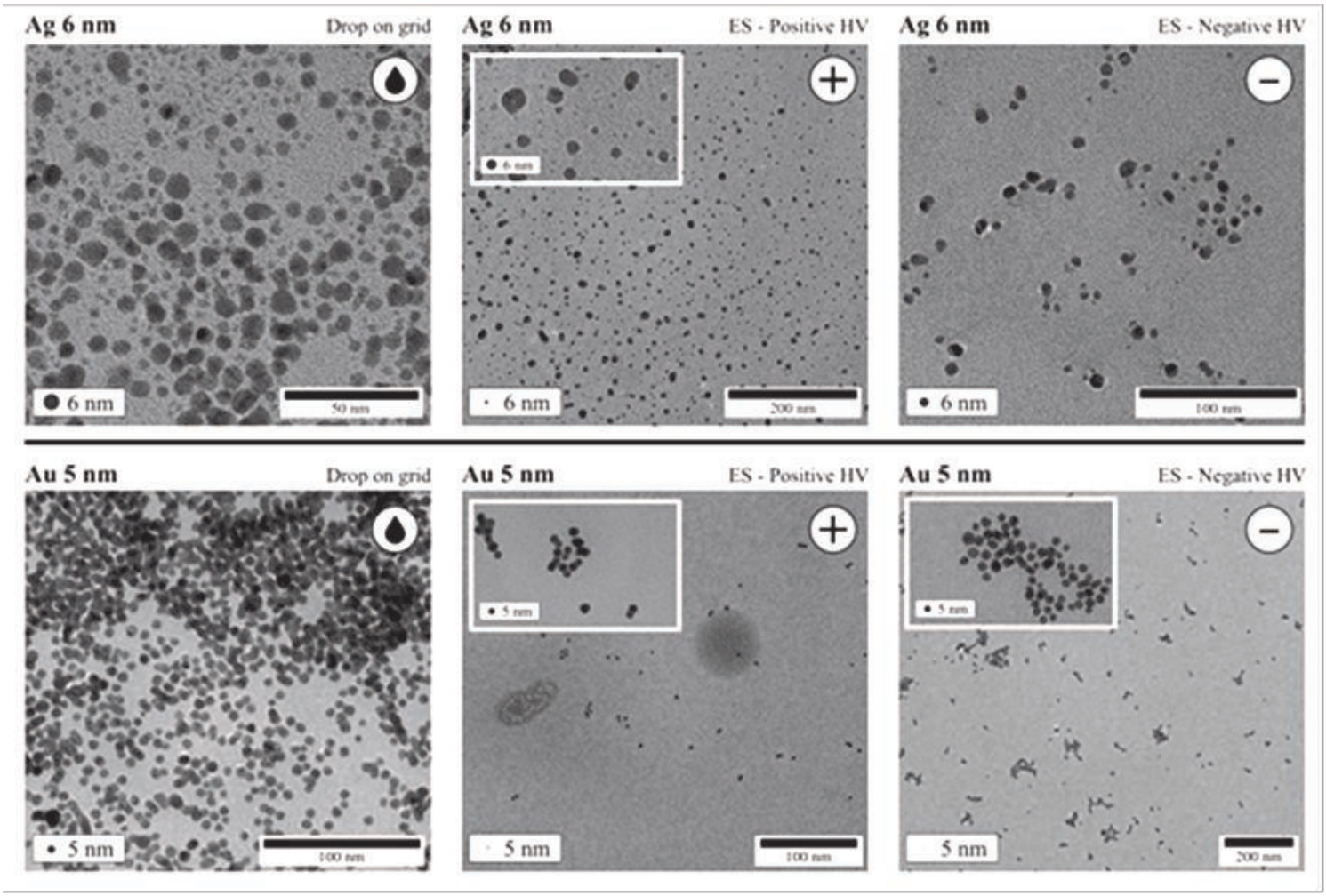

The results obtained, which will be published as soon as possible, indicate that it is possible to generate loose particles both with the ES-DEPO and using the traditional system, but it is easier to avoid clumps and aggregations of particles with the ES-DEPO. On the other hand, the difficulties encountered in finding the stable cone when the electrospray worked with negative polarity makes it difficult to obtain heterogeneous samples without accumulation (the cone tends to work in dripping mode). Therefore, the effect of the negative high voltage applied to the electrospray could not be evaluated. However, there seems to be no evidence of disturbance of colloidal stability in the case of using positive voltage, so in future studies this hypothesis can be ruled out.

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.

OpenRiskNet

RISK ASSESSMENT E-INFRASTRUCTURE

OpenRiskNet case studies to support data and tools integration from NanoSafety Cluster

OpenRiskNet e-infrastructure aims to provide resources and services to a variety of communities requiring risk assessment, including the NanoSafety Cluster (NSC) as a primary target community customer. Specific needs identified by the nanosafety community will be addressed and defined based on NSC projects requirements, hence identifying the key areas where the OpenRiskNet infrastructure can be deployed and tested. The possibilities to incorporate data and tools developed by other projects and to combine with other type of resources will be evaluated. Alignment and interoperability with the nano-specific ontology, protocols and templates, as initially developed under eNanoMapper, will also be pursued.

The different case studies will be used to test and evaluate the solutions provided to the predictive toxicology and risk assessment community especially regarding the usability of the developed computing services, supported by standardised interfaces and an interoperability layer. These cases will demonstrate the capabilities to satisfy the requirements of the different stakeholder groups including researchers, risk assessors and regulators and present real -world applications such as systems biology approaches for grouping compounds, read-across applications using chemical and biological similarity, and identifying areas of concern based on *in vitro* and *in silico* approaches for compounds lacking any previous knowledge from animal experiments.

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

Case Study Example:
Searching nanomaterial repositories for experimental data linked to known key events

This case study describes the basic process of finding and retrieving omics data related to a nanomaterial and a specific Key Event (KE) of an Adverse Outcome Pathway (AOP). The KE is related to some bioassay, and using an ontology approach, e.g. with BioAssay ontology terms, a search can be used to query databases with experimental omics data. For KEs in AOPs to be useful in decision making, the event needs to be observable, i.e., an experimental measurement needs to indicate that the key event happens and will trigger downstream events. Various other European projects are working on linking KEs to bioassays (e.g. EU-ToxRisk), but to explore this potential link, we need an infrastructure to allow researchers to find experimental data for some type of assay for some type of nanomaterial. One aspect of that is to find omics data for a particular material.

This case is evaluating the progress of the ontology services as well as the coupling of ontological terms with regards to data and assays. Using additional resources that link AOP KEs to genes, proteins, or assays, such as those being set up on the AOP portal on WikiPathways (http://aop.wikipathways.org/), the case aims to generate a needed level of interoperability to support and possibly validate European research for replacing animal testing with AOP-guided *in vitro* omics approaches.

Further information: https://openrisknet.org/development/case-studies/

About the project

OpenRiskNet (Open e-Infrastructure to Support Data Sharing, Knowledge Integration and *in silico* Analysis and Modelling in Risk Assessment) is a 3 year project funded under the Horizon 2020 EINFRA-22-2016 Programme (Project Number 731075). 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. For more information, visit : **https://openrisknet.org/**

Nano Safe Leather

THE EFFECT ON HUMAN HEALTH OF AG/TIO2NM TREATED LEATHERS FOR FOOTWEAR INDUSTRY

The need for innovation and bulk materials replacement (volatile organic compounds being in the continuous attention of REACH regulation) is high and the preparation for the extensive use of NMs will be anticipated by NANO_SAFE_LEATHER project.

The high expertise of two universities (UNIVERSIDADE DO MINHO and Montan Universität Leoben), two research institutes (R&D National Institute for Textiles and Leather-Leather and Footwear Research Institute Division and Institute of Cellular Biology and Pathology "Nicolae Simionescu") in consortium with an industrial partner (SC TARO COMMIMPEX LTD) will enrich the knowledge in the area of risk assessment of the use of NMs in industrial conditions and on the consumers in relation to the use of footwear.

NANO_SAFE-LEATHER is an ERANET SIINN project and intends to contribute to the safe use of NMs in large consumer goods by researching the Ag/TiO2NMs with multifunctional properties on leather surface and the techniques for safe deposition (classical and innovative methods).

The project brings important contributions to the main topics of SIINN call such as exposure assessment, toxicity mechanisms and effects of MNM on human health through the proposed objectives regarding:

- Estimation of Ag/TiO2NMs handling risks and dose concentration exposure risks.
- Experimental on leather surface functionalization with Ag/TiO2NMs by integration in film-forming polymeric composites and application using current spraying technologies.
- Experimental on leather surface functionalization with Ag/TiO2NMs by plasma pre-treatment and sputtering deposition techniques.
- Evaluation of leather surface new properties: antimicrobial, self-cleaning and flame retardant together with wearing simulation tests in view of Ag/TiO2NMs release survey.
- Dose-response studies of toxicological properties of Ag/TiO2NMs released by leather surface.
- In vitro assessment of the impact of MNMs and leather finished with MNMs, on different human cell lines using cytotoxicity analysis and cellular morphology.
- The investigation of cell death mechanisms and of the intracellular signaling pathways activated by MNMs.
- The cytotoxicity study on skin fibroblast cells of leather surface functionalized with Ag/TiO2NMs.
- The study of Ag/TiO2NMs on human lung epithelial cells with the aim of evaluation of the inhalation effects on human health.
- The toxicity study on water and artificial sweat leachable Ag/TiO2NMs on human skin cells and human epithelial alveolar cells.
- In silico approach which tests experimental data by computer simulation analysis, will provide information on the potential changes induced by the NPs on cellular morphology and will help build a domain ontology.
- Evaluation of surface functionalization technologies efficiency in terms of Ag/TiO2NMs release and human health risk assessment.
- Understanding the toxicity mechanism induced by soluble Ag/TiO2NMs; nano and ionic species generations in wearing simulated conditions of wearing.

You are cordially invited to attend a meeting on Categorization of Next Generation Nanomaterials that will take place in Brussels, Belgium, on November 30th and December 1st, 2017.

This is intended to be a seminal meeting where stakeholders from many arenas can discuss current issues and progress in how nanomaterials could be categorized, laying the foundations of future consensus on best practices.

The next generation of nanomaterials will see novel and innovative shapes, forms, features, and other characteristics that impart an incredible richness of performance in every application area. The correlation of nanomaterials features and characteristics with properties, functionality and performance continues to grow in complexity, creating a growing need to categorise nanomaterials for property and functionality prediction as well as risk analysis.

During the past three years, the Future Nano Needs (FNN) programme has been working to develop a scientific basis for the categorization and description for next generation nanomaterials. As the project nears its conclusion, it is timely to review the emerging categorization schemes that FNN has proposed through an Open Global Conference and to engage the international nanomaterials community in a review of the scientific basis for these schemes.

To accelerate the development of an international consensus, the FutureNanoNeeds project is holding the FNN Conference on Categorization of Next Generation Nanomaterials on November 30 – December 1, 2017 in Brussels, Belgium.

This two-day Conference brings together key thought leaders and actors from the global international community engaged in developing and testing new nanomaterials, nanoinformatics experts, and researchers engaged in read-across and QSAR work to discuss approaches for categorising next generation nanomaterials. In addition, the Conference will strategise on ways to achieve an international consensus on categorization using recent scientific results.

Progress towards consensus on the categorization of new and emerging nanomaterials One projected Conference outcome is formulation of a roadmap for developing a consensus on categorization schemes for new and emerging nanomaterials. This roadmap strategy would involve identifying key actors; major milestones; a Framework for cooperation, coordination, and priority setting; and adoption of categorization schemes by groups interested in interactions of new nanomaterials, especially those involving biological and environmental situations.

Please register here by the 15th November 2017.

For more details:

- Visit the event information page on the Project website
- View the full Conference programme
- Email project.office@futurenanoneeds.eu

**Sponsored by EU FP7 FutureNanoNeeds*

Professor Kenneth A. Dawson: University College Dublin
Dr. John Rumble: CODATA, Paris France

OpenTox EURO 2017

"Collaboration and integration: toxicology and risk assessment in the time of dynamic data"

21-23 November 2017
Hotel Stücki Basel/Technology Park Basel
Basel, Switzerland

Theme: Collaboration and integration: Toxicology and risk assessment in the time of dynamic data

Conference Topics:

1. Defined Approaches Towards Regulatory Acceptance
2. Simulations of Exposure and Transport
3. Integration and Interoperability: Software
4. Integration and Interoperability: Data
5. High-Content Imaging
6. Characterization of Experimental Conditions

Conference Sessions:

- Poster Session
- S1: Defined approaches towards regulatory acceptance
- S2: Simulations of exposure and transport
- S3: Characterization of experimental conditions
- S4: Integration and interoperability: software
- S5: Integration and interoperability: data
- S6: High-content imaging
- S7: Characterization of experimental conditions

The Conference:

The Conference will take place at the Hotel Stücki Basel, and Technology Park Basel, Basel, Switzerland.

The Organising Committee:

Barry Hardy, Thomas Exner, Martin Wilks, Vladimir Lobaskin, Iseult Lynch, Chris Evelo, Clemens Wittwehr, and Bob van der Water

Abstract Submission:

Abstracts should be submitted through the our website system and will be reviewed by the conference chairs and organising committee. Please submit your abstracts here: http://www.opentox.net/submit-abstract-poster-or-chair

Poster Session:

Posters loaded upon poster boards will be available throughout the conference. All posters will be reviewed at the meeting to provide presenters feedback. Awards for best posters will be announced in the final meeting session. http://www.opentox.net/submit-abstract-poster-or-chair

Registration:

Places are limited so please register today to reserve a place at the meeting

http://www.opentox.net/events/opentox-euro-2017

Call for individuals or teams to participate in the 1st international Nano Olympiad

The 1st Nano Olympiad competition for university students at undergraduate or PhD levels will be held in Tehran, Iran from 1-9th April 2018, preceded by intensive online training and mentoring for the teams, who will submit a report on their topic (by 15th March 2018), related to the theme for this year which is **Water and Sanitation**.

The European Commission (via the EU NanoSafety Cluster) is holding a first round competition to determine the teams that will go forward to represent Europe.

Application must be made by 17th November 2017, by submitting your CV and a letter of motivation saying why you would like to participate, using the following link: https://www.surveymonkey.co.uk/r/NanoOlympiad

Following the closing date for applications, the applicants will be organised into teams and assigned a presentation topic to work on, as the pre-selection activity. These virtual teams will then present to the European organising committee (via a webinar) on Friday 15th December, following which the final teams will be announced, and their details forwarded to the international organising committee for early January 2018, when the mentoring and online training begins.

If you have any queries, please contact Prof. Iseult Lynch (i.lynch@bham.ac.uk) or Dr. Andrea Haase (Andrea.Haase@bfr.bund.de).

Best of Luck!!

INTERNATIONAL NANOTECHNOLOGY OLYMPIAD

The International Nano Olympiad (INO) is a collaborative international annual event which holds an international competition among university level students aiming at improving motivation of the students towards gaining deeper knowledge of nanotechnology and acquiring skills for its innovative applications to real scientific and industrial problems. It is also a platform for international collaboration and networking in the relevant areas of nanotechnology. Main Goals of INO are as follows:

1. To improve motivation of the students towards gaining deeper knowledge of nanotechnology and acquiring skills for its innovative applications to challenging scientific and / or industrial problems.
2. To improve participant's basic knowledge and skills in innovation and commercialization processes.
3. To reinforce the spirit of team work among the participants.
4. To favourably affect nanoscience and nanotechnology education in participating countries.
5. To create an International network of the contestants and participant economies.
6. To raise national awareness about the nanoscience and nanotechnology in the member economies.
7. To broaden cross cultural and international networking experience among students.
8. To create a self – sustainable system of methodological material generation and new educational approaches in the field of nanoscience and nanotechnology.
9. To reveal and support the most active and talented young people in the area of nanoscience and nanotechnology over the world.
10. To perform an exchange of ideas and to promote careers of participants by building their skills and achievements in the field of nanoscience and nanotechnology.

INSPIRED Project Open Webinar

November 8, 1100 CET

The INSPIRED project addresses the printed electronics market and the high commercial potential of novel nanomaterials.

The project is creating scale up pilot lines for characterised nanomaterials including nanocoppper, silver nanowires and graphene nanoplatelets. they will be developed for application into capacitive touch screens, CIGS solar cells and LCD signage.

The consortium is strongly industry-driven including euroLCDs, Intrinsiq Materials, M-Solv, Thomas Swan and TouchNetix. The project will host a webinar to introduce the project and identify stakeholders within printed electronics applications and nanomaterial scale up and all participants are welcome.
Register here: http://www.nano-inspired.eu/event-inspired-open-webinar-november-8

caLIBRAte open webinar

January 16 2018, 1500 CET

The caLIBRAte project is pleased to host an open webinar that introduces the project and its long term mission to develop risk governance structures for the successful development of nanomaterials.

The 60 minute webinar, which is open to all interested participants will highlight project aims and activities and engage in discussion with delegates. The full agenda will be published in November and you are invited to register now to secure a place and receive agenda and slides for the meeting.
Register here: https://www.eventbrite.com/e/calibrate-project-tickets-38074845889

NanoFase Training Workshops

Carmen Nickel—nickel@iuta.de
Duisburg (Germany), 28-29 Nov 2017

Airborne ENM: Measurements, Implications and Modelling
You are welcome to join our free open workshop.
Plenary presentations alternate with focused discussion and issue-centered breakouts.
Day 1: Release, Environmental Concentration/Exposure and Modelling
Day 2: Transformation of ENM in the atmosphere and effects on the atmosphere
Venue: CENIDE - Center for Nanointegration Duisburg-Essen
Register here: carmennickel.wufoo.com/forms/z16p9w2g06zd8yi/

NanoFase—The World Congress on Risk

Gözde Kara, EU-VRi—gkara@eu-vri.eu

THE WORLD CONGRESS ON RISK is organised by the Society for Risk Analysis (SRA) to grow innovation and knowledge across risk analysis and management communities, researchers, practitioners, policymakers and related stakeholders. The event seeks to stimulate ideas and solutions for regional and global risk challenges. In May 2019, the SRA brings the World Congress to Cape Town, South Africa, where organisations, companies, academia and individuals will gather on the theme of Development and Resilience, across a broad variety of topics. Organizers include colleagues from the NanoSafety Cluster and our friends from the US CoR.
Abstracts must be submitted online by December 1, 2017, midnight EST.

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- Combine your participation with wonderful experiences in Thessaloniki and unforgettable nearby escapes!

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MATCHMAKING EVENT

Meet & connect with other expert technology developers and technology users and establish cooperation in the fields of Nanotechnologies, Organic Electronics, & Nanomedicine.

INNOVATION SHOWCASES IN NANOTEXNOLOGY EXPO 2018

NANOTEXNOLOGY is a powerful Platform with integrated exhibition and Conferences that will enable you to demonstrate and discover state-of-the-art prototypes, technologies and research results from innovative companies, leading research institutes, high-tech clusters, SMEs and EU-projects.

MEET THE EXHIBITORS

Check out the NANOTEXNOLOGY EXPO 2017 Exhibitors!

COMBINE SCIENCE WITH BUSINESS

NANOTEXNOLOGY 2017 brought together over 730 presentations, 180 Matchmaking Meetings and more than 50 Exhibitors from 59 Countries, in an exciting and very successful event!

NANOTEXNOLOGY 2018 combines the events:

- International Conference on Nanosciences & Nanotechnologies (NN18) | 3 - 6 July
- International Symposium on Flexible Organic Electronics (ISFOE18) | 2 - 5 July
- International Summer Schools "N&N, Organic Electronics & Nanomedicine" (ISSON18) | 30 June - 7 July
- NANOTEXNOLOGY EXPO 2018 | 2 - 6 July
- Business Forum & Start-Up Area | 3-5 July
- Matchmaking Event | 4 July

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NANOTOX 2018

9th International Conference on Nanotoxicology

More than ten years have passed since the first NanoTox conference – time to summarize the research of the last decade and look ahead on what's to come. Join the Nanotox community in 2018 and discuss 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 special focus of NanoTox 2018 will be "New tools in risk assessment of nanomaterials" such as read-across, grouping and categorization.

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.

NanoTox 2018 will take place in Neuss, near Duesseldorf near the so-called "Ruhrgebiet". Inspired by the biggest industrial area in Europe and yet enjoying the atmosphere o the "Old Town of Duesseldorf" with its famous breweries and restaurants, the conference will offer once again a great atmosphere for discussion, scientific exchange and sharing ideas to ensure the further progress in NanoTox.

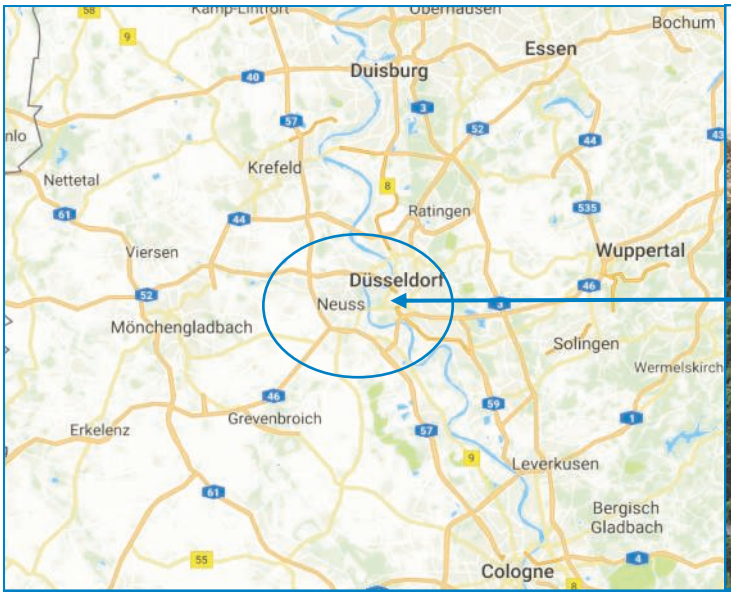
The organisers ...

- Harald F. Krug, NanoCASE, Switzerland
- Katja Nau, KIT, Germany
- Matthias Neumann, DECHEMA, Germany
- Christoph Steinbach, DECHEMA, Germany

... are looking forward to meeting you!

DECHEMA
Gesellschaft für Chemische Technik und Biotechnologie e.V.

Questions? Please contact the local organizing committee



Investigating the impact of graphene and 2D materials on the central nervous system

Faculty of Biology, Medicine and Health, University of Manchester
PhD Research Project | Directly Funded | UK/EU Students
Dr C Bussy, Prof K Kostarelos, Prof Casiraghi

Application Deadline: 16 November 2017

Details:

2D materials (2D-M) including graphene based materials (GBM) are being developed for a wide range of applications, such as composite for aerospace, automotive and building materials, or for biosensing and healthcare, or water purification. The global graphene market could be worth > $270 million by 2020. Yet, the knowledge for GBM and 2D-M potential health hazard remains limited and disparate. Lately, there have also been raising concerns about how air pollution particulate matter (in particular nanomaterials) may contribute to neurodegenerative diseases and dementia. These led us to question whether 2D-M should also be cause for concerns in relation to neurodegeneration. The project will aim to tackle the current uncertainties and knowledge gaps in relation to health impact of 2D-M after inhalation and their consequences on the central nervous system. It will focus on a panel of 2D-M which are likely to be used in a form where pulmonary exposure may occur during production or processing of the end-products, such as master batch preparation, inkjet 2D/3D printing, or large surface spraying. Using a panel of 2D-M differing in chemical composition, surface properties, lateral dimensions and thickness, the student will identify the key physicochemical parameters that may cause adverse effects in brain cells, correlating biological endpoints, internalisation and material features. 2D-M identified as hazardous in cells will be further tested in animals, using pulmonary exposure. If an impact on healthy brains is confirmed, an experimental Alzheimer's Disease model will be used to test whether exposure to 2D-M is slowing down or speeding up the progression of the disease. State of the art methodologies and facilities will be available. Imaging and characterisation techniques (including Raman imaging, high-end confocal fluorescence imaging, and high-end electron microscopy) will be used to confirm the fate of materials directly in harvested cells and animal tissues.

The candidate will be part of the Centre for Doctoral Training in Science and Applications of Graphene and Related Nanomaterials (cohort of 20 students for 2017). This programme includes an initial state-of-the-art training in fundamentals of graphene and 2D materials, their applications, and key techniques. The 6-month training is followed by a three and a half year research project. The PhD student will also receive training in media, entrepreneurship, and public engagement. Academic research within the CDT will be complemented by direct engagement with a network of industrial and academic partners. In the lab, the candidate will be trained in animal models, brain cell cultures, preparation of nanomaterials, sectioning (for TEM, histology, cryo), confocal Raman microscopy, immunohistochemistry, biochemical assays. The student will present her/his progress at the annual CDT summer conference (joint conference with Cambridge's CDT; ~80 PhD students) and the annual Lloyd's register foundation ICON conference (20 PhD students).

For information on how to apply for this project, please visit the Faculty of Biology, Medicine and Health Doctoral Academy website (https://www.bmh.manchester.ac.uk/study/research/apply/).
Please select PhD Pharmacology when applying. Informal enquiries may be made directly to the primary supervisor.

References

Bussy C, Ali-Boucetta H, Kostarelos K. Safety considerations for graphene: lessons learnt from carbon nanotubes. Acc Chem Res. 2013 Mar 19;46(3):692-701.

McManus D, …, Kostarelos K, Fiori G, Casiraghi C. Water-based and biocompatible 2D crystal inks for all-inkjet-printed heterostructures. Nat Nanotechnol. 2017 May;12(4):343-350.

Kurapati R, Kostarelos K, Prato M, Bianco A. Biomedical Uses for 2D Materials Beyond Graphene: Current Advances and Challenges Ahead. Adv Mater. 2016 Aug;28(29):6052-74.

Bussy C, …, Prato M, Bianco A, Kostarelos K. Microglia Determine Brain Region-Specific Neurotoxic Responses to Chemically Functionalized Carbon Nanotubes. ACS Nano. 2015 Aug 25;9(8):7815-30.

November

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, Australia)