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NANONET

NEWSLETTER

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TABLE OF CONTENTS

Editorial

News

- [New BioNanoNet Members](#)
- [New BioNanoNet employee](#)

BioNanoNet Member Presentations

- [ACIB – Austrian Centre of Industrial Biotechnology](#) (*silver member*)
- [Department of Water-Atmosphere-Environment, Institute of Waste Management, University of Natural Resources and Life Sciences, Vienna](#) (*standard member*)
- [Unit of Process Control and Informatics – National Technical University of Athens \(NTUA\)](#) (*extraordinary member*)

BioNanoNet Member Contributions

- [DIGI-B-CUBE project](#) (*Business Upper Austria – Health Technology Cluster*)
- [PLOS Computational Biology Research Prize 2019](#) (*CBmed*)
- [Professional MBA Biotech, Pharma & MedTech Management program](#) (*Danube University Krems*)
- [Development of new antibiotics: An urgent need. BNN Member ICCRAM studies the antimicrobial properties of new compounds](#) (*ICCRAM – University of Burgos*)
- [ME Research UK funds new research focus on chronic fatigue syndrome](#) (*University of Applied Sciences – FH JOANNEUM*)

Retrospect

- [NANOGENTOOLS, SOLUTION & NANOCOMMONS EU H2020 PROJECTS organized the International Spring School in Nanomaterials and Nanosafety](#) (22 – 24 May 2019, Alessandria, Italy)
- [NanoMed Europe](#) (17 – 19 June 2019, Braga, Portugal)
- [16th International Conference on Nanosciences & Nanotechnologies](#) (2 – 5 July 2019, Thessaloniki, Greece)
- [Joint Meeting: NanoCommons – NanoSolveIT – RiskGONE](#) (4 July 2019, Limassol, Cyprus)

- [International Young Scientist Forum 2019](#) (9 – 10 September 2019, Salzburg, Austria)
- [BioNanoNet Annual Forum & Networking Event](#) (10 September 2019, Salzburg, Austria)
- [Austrian Microfluidics Initiative \(AMI\) Workshop "Biomedicine on Chip"](#) (11 September 2019, Salzburg, Austria)

Conference Calendar

- [BioNanoNet on-site-events](#)
- [BioNanoNet Member-Event-Notifications](#)

Recent scientific publications of BNN Members

Finally

Editorial – *Contemporary issues from the network*

Dear Ladies and Gentlemen,

we hope, you found some time during this summer to relax and re-charge for the super-busy autumn of 2019. The final H2020-calls are open now and wait for submissions due in early December. Thus, if you are on your way preparing a proposal still searching for excellent partners, it would be our pleasure to connect you with our members.

Besides this, Europe prepares the “Horizon Europe” (H-EU) framework program. Several important documents (SIRAs, roadmaps, etc.) have already been published. These days, the European research & innovation days take place in Brussels to discuss in nine parallel sessions about priorities of H-EU and define its areas of interest and clusters in more detailed way. It is of utmost importance that experts contribute to this process to finally shape the framework fitting the challenges of science, research, innovation and society. BNN has been already involved in pre-stages of this preparation (e.g. contributing to SIRA’s and roadmaps) and will put huge efforts into supporting this development. Of course, we will keep our members continuously informed on that.

Another important progress could be made internally: during the [Annual Forum](#), which took place in Salzburg, our members approved the strategy BNN2020+, which now makes us busy with the implementation. We all know that we are at a very important stage to include aspects of sustainability – ecologic, economic and social – in all our work, from fundamental science to production. BNN will put its stake in to be part and to actively contribute to this process, becoming a strong partner for our members by supporting in terms of sustainable development.

Sincerely,

BioNanoNet-Team

[Click here to return to the table of contents](#)

BioNanoNet News

New BioNanoNet Members

- [acib GmbH – Austrian Centre of Industrial Biotechnology](#) (silver member)



acib is an international competence centre, developing new, environmentally friendly, economically and technically advanced processes for the biotechnological, pharmaceutical and chemical industry – all of them modelled on nature. acib is bridging the gap between academic research and producing industry. The big advantage for acib partner organisations is the possibility to translate scientific results into concrete processes and products by using scientific know-how, academic infrastructure or industrial networks. Our platform offers tailor-made solutions for our stakeholders from Academia, Industry and Investors.

<https://www.acib.at/>

- [Unit of Process Control and Informatics – National Technical University of Athens \(UPCI – NTUA\)](#) (extraordinary member)



The research interests and activities of our laboratory focus on design, modeling, identification, optimization and control of products, systems and processes.

Our efforts include not only traditional chemical engineering systems, but also energy systems (smart grids), production planning and scheduling systems as well as biological systems, with particular emphasis on systems toxicology.

We are particularly interested on data-driven modeling and control methods and on the development and application of information and web-based technologies. To deal with data

complexity, nonlinearity and noise, we are working extensively in the scientific areas of computational intelligence, machine learning and data mining.

https://www.chemeng.ntua.gr/labs/control_lab/

■ **FLUIGENT Deutschland GmbH** (extraordinary member)



Fluigent is an international company which develops, manufactures and supports the most advanced microfluidic systems available. Whether your application is with droplets, cell biology, particle studies, or in other research areas, we have the expertise and knowledge to provide the most cost effective and technically advanced solutions to your fluid control needs.

<https://www.fluigent.com/>

■ **NANOMOL TECHNOLOGIES** (extraordinary member)



NANOMOL TECHNOLOGIES is a science and innovation driven company providing cutting edge solutions to process, structure and characterize, at micro and nanoscale, active molecules of pharma, biotech and cosmetic companies. Our mission is to generate revolutionary nanomedicines and drug delivery systems with outstanding therapeutic efficacy and patient's compliance.

NANOMOL TECHNOLOGIES offers R+D services and advanced technologies to generate new nanomedicines and solutions for drug delivery that improve drug efficacy, selectivity, stability and toxicity.

NANOMOL TECHNOLOGIES is a privately held company created in 2010 and located at the Autonomous University of Barcelona Research Park (PRUAB Module B Building).

It has been created to exploit the business potential that proprietary knowledge and technologies on micro and nanostructuring of active principles can offer.

<http://nanomol-tech.com/>

[Click here to return to the table of contents](#)

New BioNanoNet Employee

We cordially welcome our new team member **Johanna K. Scheper!**



Dear all,

In an attempt to introduce myself to the BNN community I will try to summarize in the next paragraphs my background and professional career, that has always been related to the biomedical field, and finish with my role and a wish within the BNN team.

I finished my university degrees in Biology and Biochemistry, simultaneously in 2001, and started then my scientific career in the Molecular Biology Institute of Barcelona (IBMB), which belongs to the Spanish National Research Council (CSIC). During this period, I carried out experimental work towards my doctoral thesis in Biochemistry, successfully defended in March 2007, focused on the pharmaceutical development, aimed at the generation of novel compounds capable of antagonizing a specific protein-protein interaction.

From 2007 to 2009, I moved to Montpellier, France, to begin my stay as a Post-doctoral researcher at the CRBM-CNRS (Centre de Recherche de Biochimie Macromoléculaire - Centre National de la Recherche Scientifique). Those years were focused on the design and development of biosensors and inhibitors for probing and targeting proteins involved in cell cycle coordination, applying rational and multidisciplinary approaches at the interface between biochemistry, cell biology, biophysics and nanotechnology.

Once my post-doc finished, I returned to Barcelona, in January 2009, recruited by the Biomedical Research Networking Centre in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN) as R&D Project Manager of the Biosensors & Molecular Diagnostic Strategic Line. In 2011 I got the responsibility of the whole area of Nanomedicine of the center and from January 2017 until August 2019 I have been Head of the Strategic Division, that in-

cluded the International Initiatives and Projects Program of the center. During all these years the main tasks of my day-by-day working have been the care and growth of an excellent relationship with our scientists to help them with all the tasks related to their projects and developments. Together, we structured, wrote and reviewed grant applications for their projects, and decided the best way to push them forward (from submission in a specific competitive funding call, or pursuing any other type of funding way much more suitable for them, for example, the investment coming from a company interested in the project, etc). With this, I gained experience in scientific management of complex and multidisciplinary projects, as well as management of both, IP issues related to the results and regulatory issues related to them. As a consequence of being involved in an increasing cross-fertilized ecosystem in the biomedical field, I had the opportunity to have close relation with more and more biotech/medical devices/pharma companies that drove me to reinforce myself in the business skills, and so, I studied the Executive Master in Business Innovation of the Universitat Politècnica de Catalunya (UPC), from 2010 to 2012. During these two years I acquired several new skills that clearly complement my scientific knowledge and my technical abilities. Among them, it is worth to mention the understanding of global management of innovative SMEs and/or start-up's, business strategies, comprehension and knowledge of innovation models and project selection, design and creativity, public policy of innovation and innovation management. Last but not least, I like team work and I define myself as a high-speed learning person, with a trusty and confident personality. I'm native in German, Spanish and Catalan and I have very good knowledge of English and French.

In August 2019 I moved to Graz, to join BNN's team, in charge to give Scientific support and Innovation Management. Together with the BNN team I will try to build up the "Sustainability area", that should give additional know-how and opportunities to both, the BNN team itself as well as all of you, our members. Hence I will finish with a wish and at the same time my professional goal, that is ***to build up a close relationship with all of you, to become the help you may need to foster your and our future together***, in form of a project, or the creation of a start-up, or go along with you the whole process to transform your ideas in "real and sustainable" facts, meeting the needs of the present, without compromising future generations, therefore caring about the economics, environmental and societal impact it may have. My moto: all should be profitable, planet friendly and people driven!!! I'm sure we will do it!!!

Yours, Johanna

[Click here to return to the table of contents](#)

BioNanoNet *Member Presentations*

ACIB – Austrian Centre of Industrial Biotechnology



Austrian Centre of Industrial Biotechnology (acib) – innovations from nature

The Austrian Centre of Industrial Biotechnology (acib) is an international competence centre, developing new, environmentally friendly, economically and technically advanced processes for the biotechnological, pharmaceutical and chemical industry – all of them modelled on nature. Currently, more than 250 acib scientists are working on more than 150 industrial and strategic projects. Divided in 12 scientific fields, our research efforts range from biocatalysis and recombinant protein production to enzyme and protein modelling and -engineering as well as bioprocessing. This know-how is the foundation for new and improved applications and products in nearly all fields of life sciences all over the world, e.g. agriculture, environment and nature, food and feed, materials, pharma and cosmetics and health.



© acib

HOTZYMES – Developing efficient Enzymatic cascades through magnetic heating

One project, where we contribute our expertise, is the multidisciplinary H2020 FETOPEN project HOTZYMES. The project focusses on an unsatisfactory current paradigm in the biotechnological production of pharmaceuticals and biocommodities, where the coordinated use of stable enzymes is key. The use of multi-enzymatic processes is considered as a promising biomanufacturing platform, although several challenges need to be solved, such as uncoordinated enzyme function, cross reactivity, sequential reactions, enzyme inactiva-

tion or inhibition, the stability of products and cofactors and disposable bioprocesses. HOTZYMES aims to develop a new ground-breaking concept to exert functional control over different enzymes using magnetic heating. This will be enabled by an immobilisation of enzymes on magnetic particles, which are exposed to an alternating magnetic field. Due to molecular movement, a desired micro-temperature can be created at the outer layer of the particle, where the catalysts are going to be attached. To ensure an easy separation, re-utilization and integration into bioreactors, these conjugates will be integrated within porous microparticles. To meet this technological break-through, it will be also necessary to design and fabricate a new generation of magnetic bioreactors specific to the field of biocatalysis.

acib is responsible for Dissemination, Communication and Exploitation of results within HOTZYMES. We are bringing in our experiences of many years in participating in and management of EU-projects as well as our extensive network of partners in industry, academia and media.

Our services, our goal

We are an innovative and reliable coordinator and partner in several EU projects, from FP7 to H2020 including MSCA-ITNs and MSCA-RISE-projects, covering a wide spectrum of services. On the one hand, we are a professional research institution, providing state-of-the-art scientific work in the fields of professional research institution (biocatalysis, enzyme technology, protein engineering, cell engineering, bioprocess engineering, environmental biotechnology, metabolic modelling, synthetic biology and many more. On the other hand, we are experienced in the professional Dissemination and Exploitation of EU-projects. Other services include project implementation and project management and the collaboration with national and international funding agencies.

It is our declared goal to bridge the gap between academic research and producing industry and to translate scientific results into concrete processes and products, using scientific know-how, academic infrastructure or industrial networks. As a targeted-research-hub, the acib-platforms offer tailor-made solutions for our stakeholders from Investors, Academia and Industry, to connect about 200 partners in the field of industrial biotechnology. Among them are 18 partners from universities and the field of science as well as companies, e.g. BASF, DSM, Sandoz, Boehringer Ingelheim RCV, Jungbunzlauer or VALIDOGEN. Thus,

acib is a one-stop-shop and ideal partner for Open Innovation on shaping the future of Industrial Biotechnology.

esib - European Summit of Industrial Biotechnology

One step towards the future of industrial biotechnology is bringing experts from science, economy and politics together to discuss scientific and industrial challenges and new trends. For this purpose, acib initiated the European Summit of Industrial Biotechnology (esib), one of the biggest biotech conferences in middle Europe and an international platform for industrial biotechnology in multiple contexts. The event not only covers science but also deals with industrial needs and hopes, economic demands, funding resources or political aspirations and leaves space for networking and recreation. It encourages all protagonists of industrial biotechnology to think outside the box and in new comprehensive dimensions. Esib, taking place in Graz between 18th and 20th of November 2019, has the guiding thread "Next generation bioproduction", considering the future perspectives beyond 2020. Take the opportunity and learn from celebrated experts, executives and entrepreneurs, get new inputs from politics and funding agencies and develop profitable ideas with prospective partners.

Take the chance and register for the esib 2019 here: <https://www.esib.at/registration/>

To learn more about acib, visit our website: www.acib.at

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[*Click here to return to the table of contents*](#)

Institute of Waste Management, University of Natural Resources and Life Sciences

University of Natural Resources and Life Sciences



The University of Natural Resources and Life Sciences, the Alma Mater Viridis, was founded in 1872 and perceives itself as a teaching and research centre for renewable resources, which are necessary for human life. It is BOKU's objective to help make a considerable contribution to the conservation and protection of resources for future generations by providing diversity in its fields of study. Connecting natural sciences, engineering and economic sciences, we wish to increase knowledge of the ecologically and economically sustainable use of natural resources to provide a harmoniously cultivated landscape.

An important feature of BOKU's research lies in its recognition of future problems and efforts to provide and stimulate practical relevance, internationality and among disciplines. Thus, interdisciplinary cooperation of scientists on an international level is obvious.

BOKU's teaching is designated to state of the art content and current issues that are based on dynamic research and a high level of practical relevance using modern didactic methods. Today, BOKU is a modern, internationally oriented "University of Life" with 8 Bachelor's and 26 Master's programmes for over 12,500 students.

Institute of Waste Management (ABF-BOKU)



© BOKU

The Institute of Waste Management (ABF-BOKU) belongs to the Department of Water, Atmosphere and Environment (WAU). The ABF-BOKU currently employs 33 researchers and 7 non-scientific staff members and is equipped with a state of the art laboratory for environmental monitoring (from greenhouse gases to nanoparticles) and waste characterization. Since 2016, Univ.Prof. Dipl.Ing. Dr. Marion Huber-Humer, full professor in “Global Waste Management”, is the head of the institute.

Climate change, water pollution, and soil contamination cause global and local variations to the environment, and therefore we feel responsible to deal carefully and economically with available resources. Within the scope of the BOKU areas of competence *Soil - Ecosystems* and *Water - Climate - Environment*, the ABF-BOKU develops innovative programs, methods, and procedures for

- closing of natural and anthropogenic cycles
- proper low-emission treatment of waste materials
- monitoring and remediation of environmental damages
- sustainable integration of ultimately landfilled waste materials in the cultural landscape

Our focus lies on natural processes. Understanding of the natural scientific background advances our expertise in the field of application. The manifold network of competences available at the BOKU provides a wide possibility of partnership, unique in Austria. For this, we are working on many interdisciplinary projects (further information can be found [here](#)). Some selected nano-related project are described in more detail below:

NanoMia – Nanomaterials in waste: Evaluation of regulations and procedures for the detection of nanomaterials in waste streams (04.2014 – 04.2015)

As part of the NanoMia project, this nanoprodut database of the Institute for Technology Assessment of the Austrian Academy of Sciences (ITA/ÖAW), which has existed since 2007, was updated and as of July 2014 more than 490 entries could be recorded¹. International trends show that the number of nanoproduts is also increasing every year. Since all consumer produts are disposed of at the end of their useful life, NanoMia dealt with "nanowaste". The aim of the NanoMia project was to estimate the fate and behaviour of artificially produted nanomaterials at the end of the use phase, i.e. in waste treatment processes, on the basis of literature research and the preparation of disposal scenarios (material flow analyses). Six different nanoproduts (wall coverings, cleaning cloths, TV sets, sunscreen, car seals, tennis rackets) were selected from the updated database to illustrate

¹ NanoTrust Dossier Nr. 009 & Nr. 041, <http://www.oeaw.ac.at/ita/projekte/nanotruster/dossiers>

the state of knowledge on their environmental behaviour from the point of view of waste technology and waste law. While some products release nanoparticles mainly during the use phase by washing out, others only release nanoparticles through mechanical, chemical or thermal processes during individual waste treatment steps. The material flow analyses and disposal scenarios investigated in NanoMia confirm that wastewater and waste treatment plants can serve as potential "hotspots" or "sinks" for nanomaterials. The knowledge on the subject of "nanowaste" revealed by the project NanoMia can be found in the dossiers written as part of NanoMia².

SafeNanoKap – Applicability of the safe-by-design concept using the example of product development of nanomaterial-containing coffee capsules (03.2017 – 02.2018)

Millions of aluminium and plastic coffee capsules are consumed every day. In terms of life cycle considerations, the potential environmental impact of coffee capsules depends primarily on the composite materials used and their subsequent recycling and disposal routes. As long as empty aluminium capsules are not collected separately and recycled, plastic capsules that are thermally recycled show a comparatively better ecological balance. However, capsules made of polymer composites have the disadvantage that they have to be additionally modified in order to guarantee gas impermeability. Nanotechnology makes it possible to meet the requirements for such food contact materials by using nanoscale additives or fillers in plastics. Within the framework of the "SafeNanoKap" project, it is therefore assumed that the market potential of coffee capsules made from nanotechnologically modified polymer composites will increase considerably. Within the framework of the project, the so-called "safe-by-design" concept (SbD) could not only be examined theoretically, but also its practical applicability. On the basis of the selected product example, life cycle mapping and step flow analysis were used to identify possible risks and environmental impacts of nanomaterials in plastics and to illustrate the strengths and weaknesses of the SbD concept.

NanoAdd - The importance of functional fillers and nanoscale additives for plastics in the recycling industry (11.2018 – 10.2019)

Plastics are widely used and indispensable materials in industry and everyday life. They have a variety of functions that contribute to overcoming a number of societal challenges. In 2016, global plastics production was approximately 335 million tonnes, with 60 million

² NanoTrust Dossier Nr. 040, Nr. 043 & Nr. 044, <http://www.oeaw.ac.at/ita/projekte/nanotruster/dossiers>

tonnes coming from Europe. According to a European Commission report, the most important customer sector is the packaging industry (approx. 40%), followed by the construction and automotive industries (approx. 20% and 9% respectively). However, the way in which plastics are currently produced, used and disposed of all too often leaves untapped the economic benefits of a more 'closed loop' economy and damages the environment. In Europe, plastic waste amounts to around 25.8 million tonnes per year. Of this, approx. 30% is reused in the sense of the circular economy. Around 39% of used plastics are used to generate energy and 31% continue to be landfilled. This means that a large proportion of these potential secondary resources are not recycled. In Austria, for example, approx. 300,000 tons of packaging materials alone are generated annually, with only 26% of these waste materials being used as regranulates and 74% recycled for energy. In order to be able to do justice to the initiative launched by the European Commission in 2015 to promote recycling of plastic waste, it must also be borne in mind that plastics are becoming "thinner", "more advanced" or "smarter" or more functional as a result of increasing material efficiency or the use of innovative additives and/or the combination of various materials, but that their recyclability suffers enormously as a result. In the "NanoAdd" project, the role of these "advanced nanocomposites" in the recycling of plastics and their impact on the recyclability of the products are to be examined more closely. For this purpose, company surveys on recyclability and specific market shares will be carried out. In addition, industry-specific databases and in-depth expert interviews will be conducted in order to generate reliable data on the quantities of innovative fillers and additives actually used. These data are in turn the basis for material flow analyses in order to be able to quantitatively map the significance of innovative aggregates in the Austrian plastics cycle. A stakeholder workshop is to be held to concretize the plastic applications. In addition, both the potential positive and negative effects of innovative plastic products will be summarized. The project results are to be discussed in a final workshop with a view to a functioning recycling economy in order to derive recommendations for action.

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<https://boku.ac.at/en/wau/abf>[Click here to return to the table of contents](#)

Unit of Process Control and Informatics (UPCI) at National Technical University of Athens (NTUA)



The Unit of Process Control and Informatics (UPCI) is part of the School of Chemical Engineering of the National Technical University of Athens (NTUA), the oldest and most prestigious educational institution of Greece in the field of technology, with an unceasing contribution to the country's scientific, technical and economic development since its foundation in 1836.

Research areas: The Unit of Process Control and Informatics, led by Prof. Haralambos Sarimveis, has a long experience in modelling of biological systems, with particular emphasis on systems toxicology and extensive work on QSAR, nanoQSAR and PBPK modelling. UPCI activities include design, modeling, identification, optimization and control of products, systems and processes.

Highlights from current research: The Unit of Process Control and Informatics has participated in numerous EU and national projects in the area of chemoinformatics and nanoinformatics, both from the chemical safety and the efficacy perspective. UPCI's participation in research projects includes *OpenTox* and *eNanoMapper*, while currently it is involved in *OpenRiskNet*, *NanoCommons* and *NanoSolveIT*. Our work focuses on providing algorithms, tools and methodologies that enable predictive assessment of substances based on openness and interoperability, ensuring both functionality and safety and supporting Safer by Design implementations.

The screenshot shows the Jaqpot web application interface. The top navigation bar includes the Jaqpot logo and a search bar. The main content area is divided into several sections:

- MODEL Information:**
 - Title: ORN consensus RFE 34
 - Owner: filippod
 - Description: Logistic Regression+RFE
- Choose method:** A dropdown menu currently set to 'Predict'.
- Upload dataset with the required independent features and values:** A section with a download icon and an upload icon.
- Input values for the independent features:** A grid of input fields for various features:
 - ATS6p, ATS6se, nSpiro, ATSC8v
 - NddsN, ATSC8pe, NTCH, Lipinski
 - SdsN, ECIindex, SMR_VSA6, SsssN

Software developed by the group:

- **Jaqpot** modelling platform (<https://api.jaqpot.org/jaqpot/swagger>) and user application (v4 <http://www.jaqpot.org>, v5 <https://app.jaqpot.org>): It includes a variety of computational tools for descriptor calculation and selection, image analysis, QSAR modelling, dose-response modelling, grouping methods, read-across strategies, optimal experimental design, biokinetics and PBPK modelling and interlab testing. Jaqpot has been developed using the RESTful semantic web architecture, so it is extendable, it can communicate and be linked with other applications, through rigorously designed APIs. Jaqpot has integrated the complete Scikit-learn and Caret machine learning libraries and includes deep learning functionalities. Users can easily deploy their own models as ready-to-use web applications. Our vision is to make Jaqpot a central repository for developing, hosting and sharing predictive models.
- **PBPK control** (<http://www.jaqpot.org:8088>): A user application for creating and simulating PBPK models and for calculating optimal dosing strategies based on the Model Predictive Control (MPC) methodology.
- **RRegrs**: An R package for automated machine learning modelling (Collaboration with University of Maastricht). (<https://github.com/enanomapper/RRegrs>)

Events: UPCI will be participating to the following events: 1) NanoSafety Cluster meeting in Copenhagen, Denmark (7-10 October 2019, <https://www.nanosafetycluster.eu/nsc-week-2019/>) and 2) Final OpenRiskNet Workshop (23–24 October 2019, <https://openrisknet.org/events/74/>) with a workshop on the ModelRX case study, where Jaqpot plays a key role. We hope we can meet in person there!

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[Click here to return to the table of contents](#)

BioNanoNet *Member Contributions*

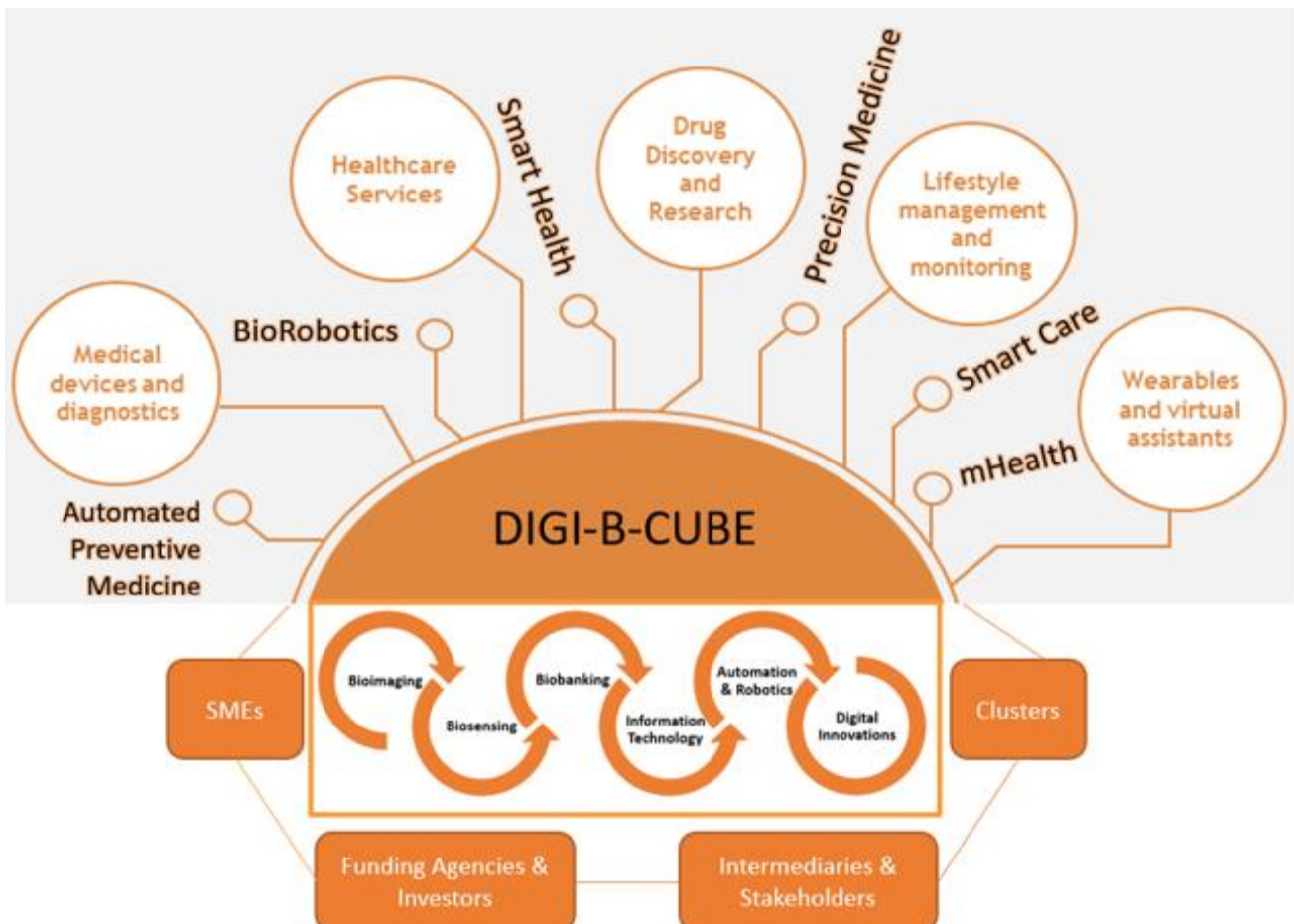
Contribution from Business Upper Austria – Health Technology Cluster



DIGI-B-CUBE project

The DIGI-B-CUBE project, funded under Program Horizon 2020 by the European Union (EU), aims to establish a cross-border and cross-sectoral ecosystem that combines digital innovations from the IT sector with three key important industries (Bioimaging, Biosensing and Biobanking) within the health sector.

The project consortium consists of a cluster network, 5 clusters and 3 SMEs, whereby the following countries are represented: Norway, Germany, Belgium, Spain, Austria, Greece and Portugal. The duration of the project is 3 years (May 2019 – April 2022) and the project is coordinated by the Oslo Cancer Cluster in the role of lead partner.



The project aims are to unlock the cross-sectoral collaborative potential of SMEs by combining Artificial Intelligence (AI), Cognitive Computing Digital Technologies (CCDT) with the Bioimaging-Biosensing-Biobanking (B-CUBE) industries to deliver market sensitive disruptive technologies and generating innovative solutions that enhance patient-centred diagnostic work-flows, delivered through the improved algorithms for Medical Diagnostics' efficiency and accuracy. By integrating innovations in IT into Bioimaging, Biosensing and Biobanking industries, this project will accelerate the goal of personalised medicine that can eventually offer patients with fast and efficient diagnosis-treatment-healthcare system.

DIGI-B-CUBE will foster the development of customized solutions and prototypes by providing innovative small and medium-sized enterprises (SMEs) in the EU and Associated Countries with access to vouchers of up to € 60,000. The voucher scheme call will be launched in April 2020, but SMEs can start engaging in the project's activities in the coming months by participating in the project's sectoral and cross-sectoral workshops as well as match-making sessions.

For more information, please follow us on social media and stay tuned with our website <http://digibcube.eu>.

On 7 November 2019 a **Workshop on DIGI-B-CUBE** takes place in Linz. For more information click [here](#).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824920.

[Click here to return to the table of contents](#)

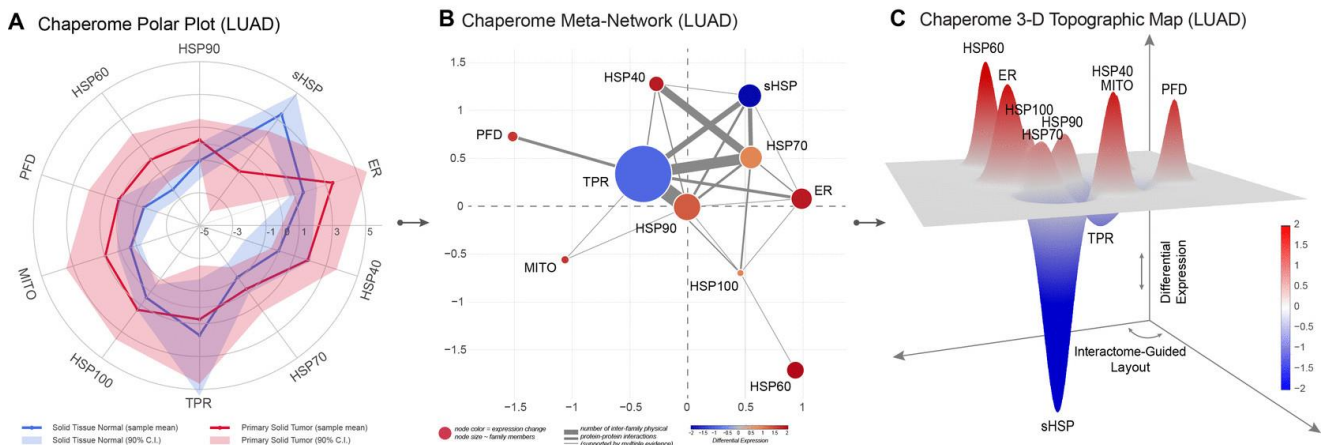
Contribution from CBmed



PLOS Computational Biology Research Prize 2019

Dr. Marc Brehme, Head of Systems Biology & IT at CBmed GmbH, was awarded the “PLOS Computational Biology Research Prize 2019” in the category “Breakthrough Advance/Innovation”, chosen amongst > 500 papers published in PLOS Computational Biology throughout 2018 for a study conducted between 2016 – 2017 while a Research Group Leader at the Joint Research Center for Computational Biology, RWTH Aachen University with funding by Bayer AG that was published in the paper “A systematic atlas of chaperome deregulation topologies across the human cancer landscape” (<https://www.ncbi.nlm.nih.gov/pubmed/29293508>).

Human Chaperome Gene Expression Alterations in Lung Adenocarcinoma (LUAD)



The study describes a new meta-PCA based method and associated M-score, including a software tool (Pro2 - Proteostasis Profiler), and its application for the quantification and visualization of systems-level chaperome interactome network deregulation topologies across 22 solid cancers based on TCGA data covering > 10,000 patient biopsies, and selected neurodegenerative diseases based on microarray gene expression data. The chaperome, the ensemble of all human molecular chaperones and co-chaperones, is an intricate network of molecular folding machines and represents a core component of the cellular proteostasis network (PN), which acts to safeguard the native, folded proteome. Global views

are obtained on the vast disturbances of this fundamental cellular network of molecular folding machines in the diverse spectrum of human cancers, while differences between functional chaperome families and cancers are revealed. These chaperome alterations lend themselves as candidates towards network-based biomarkers for new approaches to proteostasis adjustment in cancer therapy. The study represents a pioneering effort into assessing network-level proteostasis alterations in human cancers at a systems-level.



Dr. Marc Brehme, Head of Systems Biology & IT at CBmed GmbH, was awarded the “PLOS Computational Biology Research Prize 2019” in the category “Breakthrough Advance/Innovation”

More information:

<https://www.plos.org/computational-biology-research-prize>

<https://blogs.plos.org/biologue/2019/05/31/announcing-the-winners-of-the-2019-plos-computational-biology-research-prize/>

<https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1005890>

www.cbmed.org

[Click here to return to the table of contents](#)

Contribution from Danube University Krems



Professional MBA Biotech, Pharma & MedTech Management program

The Department for Biomedical Research offers the Professional MBA Biotech, Pharma & MedTech Management program, designed for managers in pharmaceutical and medical organizations to be prepared to take over demanding managerial positions in biopharmaceutical companies in a competitive international environment.

For more details please visit www.donau-uni.ac.at/biotech-mba.

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[Click here to return to the table of contents](#)

Contribution from ICCRAM – Universidad de Burgos



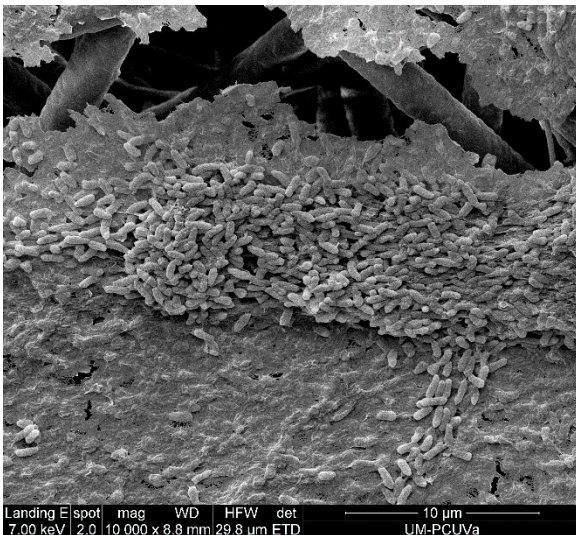
UNIVERSIDAD
DE BURGOS



ICCRAM
INSTITUTO DE INVESTIGACIONES EN QUÍMICA Y FÍSICA

Development of new antibiotics: An urgent need. BNN Member ICCRAM studies the antimicrobial properties of new compounds.

Historically, infectious diseases constituted one of the main causes of mortality worldwide. Consequently, the discovery and subsequent development of antibiotics is considered the most important achievement of Medicine in the 20th century. Their use and expansion led to a dramatic decrease in the mortality caused by bacterial infections. However,



Landing E spot mag WD HFW det 10 μm
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SEM images showing a bacterial biofilm of *P. aeruginosa*.

practically at the same time, bacteria could adapt to this new treatments developing antimicrobial resistance via a range of different resistance mechanisms, such as the modification of the antimicrobial target or the alteration of their membrane permeability.

The emergence of hospital-acquired infections caused by multidrug resistant (MDR) bacteria is one of the major therapeutic challenges that

modern medicine is facing nowadays. The term “ESKAPE” (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*,

Acinetobacter baumannii, *Pseudomonas aeruginosa* and *Enterobacter* spp.) includes a group of clinically relevant pathogens that exhibit multidrug resistance and that are frequently involved in nosocomial infections, which are specially worrying in intensive care units, where they present high mortality rates.

BNN Member ICCRAM, a competence Center of the University of Burgos (Spain) devoted to advanced materials and Critical Raw Materials for advanced industrial technologies, has also a research line focused in the study of the antimicrobial activity of new compounds. Recently, this institution was involved in a study where the antimicrobial activity of small

molecule anion transporters was tested in different clinically relevant strains (*Chem. Commun.*, 2019, 55(68): 10080-10083. [DOI:10.1039/c9cc04304g](https://doi.org/10.1039/c9cc04304g)). Among all of the compounds tested, one named as “compound-1” stood out for its ability to be active against both Gram-negative and Gram-positive pathogens. In addition, compound-1 proved to be safe at concentrations that showed antimicrobial activity in hemocompatibility assays. These promising results represent an important first step in the development of this compound as a new antimicrobial agent.

Due to their implications for human health, as well as the high costs for healthcare systems that they represent, nosocomial infections caused by MDR pathogens are a worrying problem for the scientific community and the society. For this reason, the development of new compounds with antimicrobial activity is an issue of critical importance. Currently, researchers are focusing their efforts on the search of new alternatives to traditional antibiotics or, at least, molecules and compounds that can improve their effectiveness. ICCRAM, with its expertise in different microbiology techniques used in the study of nosocomial pathogens, such as minimal inhibitory concentration calculation or biofilm formation studies, can contribute to this important concern and participate in related projects.

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[Click here to return to the table of contents](#)

ME Research UK funds new research focus on chronic fatigue syndrome

Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is a serious, long-term illness that affects many body systems. A research team at University of Applied Sciences in Graz investigates underlying molecular mechanisms.

Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is a multiorgan disease that affects an estimated 17-24 million people worldwide. ME/CFS is mainly characterized by persistent exhaustion not improved by rest, cognitive impairment, and chronic pain which can worsen after performing even minor mental or physical effort. Although the exact cause of this syndrome is still unknown, there is accumulating evidence that some patients with ME/CFS show disturbances of the immune system, where chronic inflammation seems to be linked to their symptoms.



*The current ME/CFS research team at University of Applied Sciences (Monika Riederer, Francisco Westermeier, Jennifer Blauensteiner)
© University of Applied Sciences*

A potential association of endothelial function in ME/CFS

In several known pathologies, inflammation is known to affect the cardiovascular system via the endothelial function, which is responsible for controlling the normal blood flow and ade-

quate oxygen supply to all tissues in the body. The endothelial function is primarily dependent on the production of nitric oxide by the endothelial cells which form a thin membrane that line the entire cardiovascular system, from the heart to the smallest blood vessels. But nitric oxide is a double-edged sword: while it is essential in normal endothelial function regulating blood flow, too much can be damaging and lead to chronic inflammation in the immune system.

About the study

To try to evaluate this potential association in ME/CFS, a research team at FH JOANNEUM University of Applied Sciences in Graz will explore the mechanisms that control NO production by using blood samples obtained from the UK ME/CFS Biobank. The researchers hope their findings will shed light not only about new pathophysiological aspects, but also provide further evidence towards the identification of endothelial biomarkers in ME/CFS. ME Research UK - the main independent funder of biomedical research in the UK and Europe - has recently funded this study, the first one focused on ME/CFS in Austria.

Contact:

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[Click here to return to the table of contents](#)

BioNanoNet *retrospect*

NANOAGENTOOLS, SOLUTION & NANOCOMMONS EU H2020 projects organized the International Spring School in Nanomaterials and Nanosafety

22nd – 24th of May 2019, Alessandria, Italy



In the framework of three EU projects focused in the development, application and safety of nanomaterials, the Spring School “*Applications and Safety Assessment of Nanomaterials: New Technological Approaches and Regulatory Aspects*” was celebrated at the Università del Piemonte Orientale (UPO) in May 2019. The organization, led by UPO and the ICCRAM research center from the Universidad de Burgos, brought together first-class scientists, experts in regulatory issues, industry stakeholders and students to offer a series of keynote lectures, hands-on sessions, and elevator pitch-sessions for students, including as well different social activities in Alessandria city and the surroundings of the Piemonte region in Italy.

The Spring School focused on applications, regulatory and safety aspects of synthetic and natural nanomaterials, including keynotes and presentations by international experts involved in European-level research projects (NANOAGENTOOLS, NANOCOMMONS, SOLUTION and THE GRAPHENE FLAGSHIP) and in international organisations dealing with different aspects of nanomaterials (EU-Nanosafety Cluster and REACH).



The sessions addressed four main topics:

- Nanomaterials synthesis
- Nanomaterials risk assessment
- EU regulations on nanomaterials
- Scientific data management

More than 40 attendees from 8 countries met in Italy to attend the event. MSc students, PhD students, and Postdoctoral researchers received a comprehensive overview of theoretical, practical, and technological issues related to current applications of nanomaterials, the overarching legislation regulating their use, and state of the art toxicology analysis approaches followed to assess their risk and guarantee their safety. The participants of the Spring School were engaged to present their own research work to experts in a dedicated session, and had the chance to get their feedback.

The main lectures of the school will be edited to published as a MOOC in Applications and Safety Assessment in Nanomaterials, which will be part of NANOGENTOOLS learning material. Interviews with the participating experts sharing their professional opinion on different nanomaterials aspects will be included too.

This Spring School was organized in the framework of three EU H2020 projects, NANOGENTOOLS (MSCA-RISE GA: 691095) coordinated by the University of Burgos, SOLUTION (MSCA-ITN GA: 721642) coordinated by the University of Southampton and NANOCOMMONS (INFRAIA GA: 731032) coordinated by the University of Birmingham.



© ICCRAM



These projects have received funding from the European Union's Horizon 2020 programme under grant agreement n° 731032 and under the Marie Skłodowska-Curie grant agreement n° 691095 and n° 721642.

[Click here to return to the table of contents](#)

NanoMed Europe



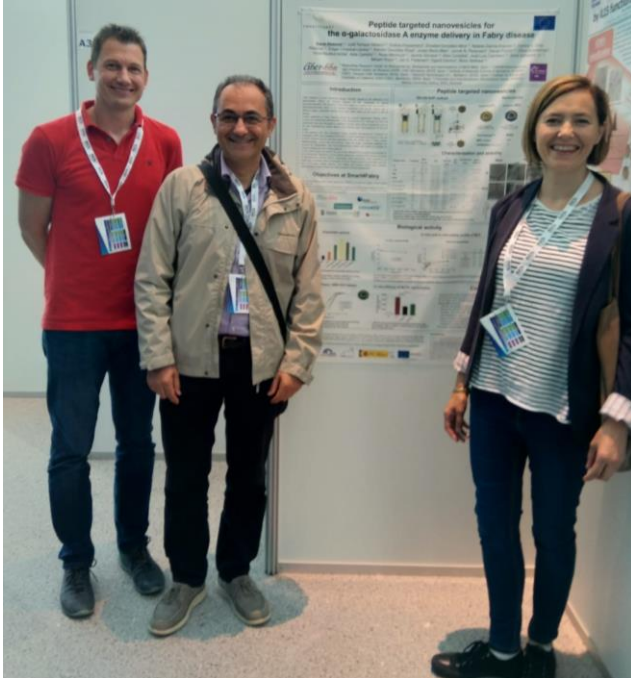
17th – 19th of June 2019, Braga, Portugal

NanoMed-Europe (NME19) was born from the merge of the 14th annual event of the ETPN & the European scientific conference ENM (after London 2017 & Grenoble 2015). Together, these two major events form a new and unique conference for the European Nanomedicine community, bringing together scientists, technology providers, entrepreneurs, industry and clinicians.

During NME19, it was possible to discover and share nanomedical innovations during the presentations and the poster sessions. Furthermore, dissemination activities of most recent scientific discoveries and H2020 projects results were performed (e.g. Smart-4-Fabry, R2R Biofluidics, ACEnano), as well as the workshop of national nanomedicine associations in the frame of the NOBEL-project. BNN participated in this workshop, representing Nano-Medicine-Austria and gained some insights about the Cluster “health” which is prepared for the next framework program Horizon Europe.



Furthermore, BNN presented a poster in the session of “smart therapeutic nanosystems”, entitled “Safety Evaluation and Up-Scaling Challenges towards Development of Safe Nanomedicine for Fabry Disease”. This work was done in the EU-H2020-project Smart-4-Fabry.



Poster presentations at NanoMed Europe.



© BioNanoNet



These projects have received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement n° 720942, n° 766492, n° 646260 and n° 720952.

[Click here to return to the table of contents](#)

16th International Conference on Nanosciences & Nanotechnologies



2nd – 5th of July, 2019, Thessaloniki, Greece

Following a long tradition, the 16th International Conference on Nanosciences & Nanotechnologies (NN19) took place from 2nd to 5th July 2019 in Thessaloniki, Greece, focusing on the latest advances on nanoscience and nanotechnology and promoting profound scientific discussions between scientists, researchers from different disciplines and market leaders.

Front-line experts from multidisciplinary research and application areas were attending this conference, to discuss the benefits of nanoscience and nanotechnology in their R&D efforts, to advance the networking and collaborating between different academia, research and industry players in the field, and to stimulate the exchange of educational concepts.

The NN19 conference was comprised of associated workshops and special events, covering the latest developments in the following fields:

- Nanoelectronics
- Photonics
- Plasmonics & nanoenergy nanomaterials
- Nanofabrication
- Nanoengineering & nanoconstruction
- Nanomedicine
- Biosensors & bioelectronics
- Graphene & related materials

The international conference program was structured in plenary, keynote, invited, oral and visual presentations and covered the entire range of nano-related research, technologies and applications, focusing on the latest scientific, technological and market-related trends.

BioNanoNet participated the conference and contributed a poster presentation on the H2020 projects NANOGENTOOLS and R2R-Biofluidics, addressing the following topic:

“High-volume Manufacturing of Bioanalytical Microfluidic Lab-on-a-Chip Devices by Roll-to-Roll (R2R) Imprinting”, *S. Resch, C. Schimpel, G. Bijelic, N. Briz Iceta, A. Egizabal Luzurjaga, J. A. Tamayo-Ramos, M. Smolka, A. Falk.*



Impressions of the NN19 conference.

© BioNanoNet

The conference was a great success and provided excellent opportunities to connect to nano-professional on international level.

The next NANOTEXNOLOGY conference will take place from 4th to 11th July 2020. For more information, please visit the organisers' webpage: <https://www.nanotextology.com>.



The projects R2R Biofluidics and NANOGENTOOLS (grant agreement n° 646260 and n° 691095) have received funding under the European Union's Horizon 2020 research and innovation programme.

[Click here to return to the table of contents](#)

Joint Meeting: NanoCommons – NanoSolveIT – RiskGONE

4th of July, 2019, Limassol, Cyprus

Several EU H2020 projects working on nanosafety, met in *Limassol* on *July 4th, 2019*, right after the *NanoCommons 4th General Assembly*.

This event joined partners from the H2020 projects [NanoCommons](#), [NanoSolveIT](#) and [RiskGONE](#). As synergies and common topics have been identified, there is no need to re-invent the wheel but to work together in order to achieve best results in a shorter time, organize joint events with common stakeholders and approaching a larger community, increasing the impact of the projects. In this way, all three projects will profit from each other.

The presented and discussed topics were mainly:

- Datasets and modelling
- Risk assessment of nanomaterials
- Data Management and FAIR scopes
- NanoInformatics tools
- Joint dissemination plan

The BNN-members [Allergy-Cancer-BioNano Research Centre of the University of Salzburg](#); [Novamechanics](#) ; [University College Dublin - School of Physics, Science Centre](#) ; [Unit of Process Control and Informatics - National Technical University of Athens \(UPCI - NTUA\)](#) ; as well as BioNanoNet itself are consortium partners in NanoCommons and will be happy to assist you if any further is needed. From BNN-Team, Beatriz is your contact – please do not hesitate to [contact](#) her.

For more information, please consult the projects website:

- [NanoCommons](#)
- [NanoSolveIT](#)
- [RiskGONE](#)



These projects have received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement n° 731032, 814572 and n°814425.

[Click here to return to the table of contents](#)

International Young Scientist Forum 2019

9th – 10th of September 2019, Salzburg, Austria



The [1st International Young Scientist Forum](#) was organized as a satellite event of the [International Particle Toxicology Conference](#) and took place in Salzburg, Austria, on the 9th and 10th September 2019.

The event allowed young scientists working in all fields in the broader area of particle and fibre toxicology to come together, discuss state-of-the-art developments, broaden their scientific knowledge and advance their own career and research skills.

Furthermore, participants of the Young Scientist Forum had the opportunity to win **prestigious awards (Best Poster Award, Best Talk Award, Best Team Award)**.

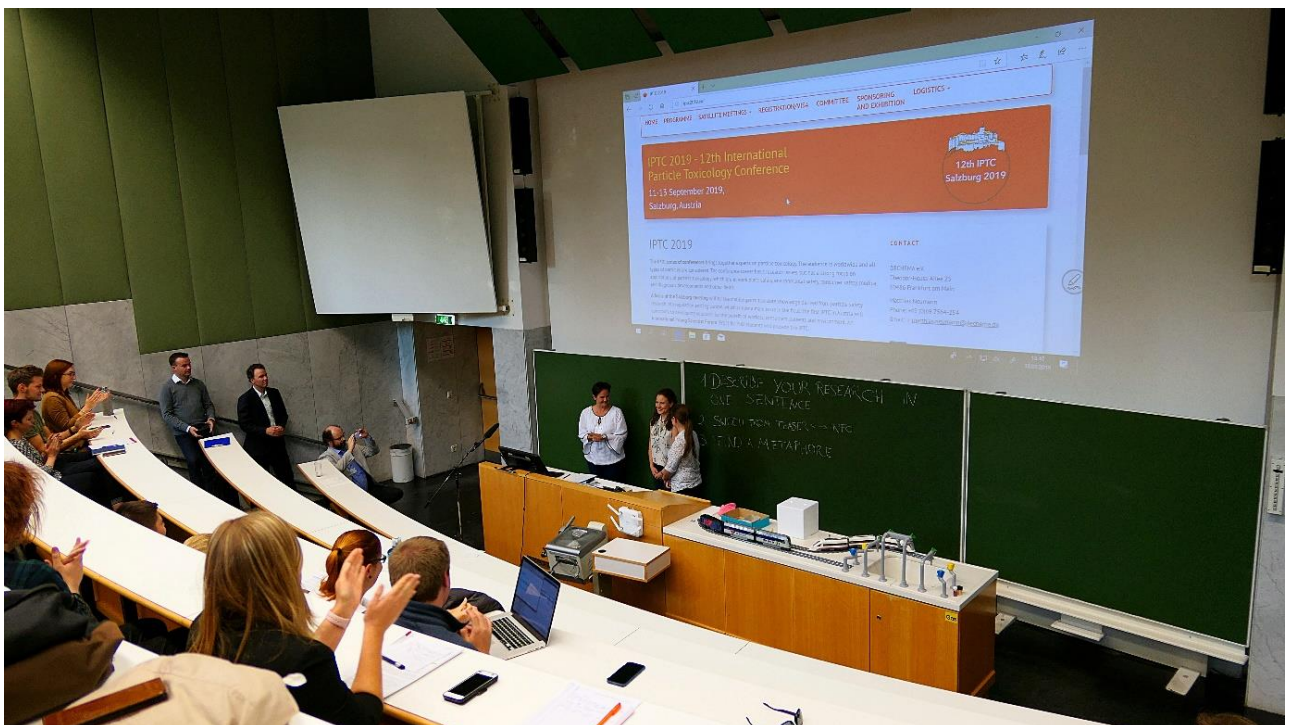
BioNanoNet supported the organization of an interactive session on the topic “*Successful science communication: How to best communicate with the general public or in social media*”. The panel discussion showed and compared different forms of science communication in old and new media, and focused on how to engage the public. Two experts in this field, Birgit Strohmeier (Salzburg Research) and Bruno Benedetti (Paracelsus Medical Private University) provided their ideas and views on current and future trends in science communication. The session was chaired by Linn Voss (BfR) and Sara Michelini (ACBN).

BNN-member [Allergy-Cancer-BioNano Research Centre of the University of Salzburg](#) (ACBN), organizer of the IPTC2019, locally supported the International Young Scientists Forum; furthermore, ACBN together with [Bundesinstitut für Risikobewertung \(BfR\)](#), [University of Birmingham](#), and BioNanoNet (BNN) are consortium partners in NanoCommons and were part of the Organising Committee of the event.



Organisers and participants of the IYSF 2019.

© IYSF Organising Committee



Interactive Session on “Science Communication” with Andrea Haase (BfR), Linn Voss (BfR) and Sara Mich-
elini (ACBN).

© IYSF Organising Committee



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 731032.

[Click here to return to the table of contents](#)



BioNanoNet (BNN) Annual Forum & Networking Event

10th of September 2019, Salzburg, Austria

The *BNN Annual Forum & Networking event* took place on 10th of September 2019 at the premises of the University of Salzburg attracting about 40 participants.

The BioNanoNet Annual Forum was opened with a welcome speech given by the **Vice Rector for Research, Univ.-Prof. Dr. Fatima Ferreira**. The meeting was scientifically started with three keynote lectures from the host organization University of Salzburg: **Univ.-Prof. Dr. Albert Duschl** from the Department of Biosciences & Research Centre ACBN gave a presentation on how allergy, cancer and BioNano fit together, **Univ.-Prof. Dr. Nicola Hüsing** from the Department Chemistry and Physics of Materials & ACBN Research Centre talked about chemical design of multifunctional oxide nanoparticles and last but not least **Assoc. Univ.-Prof. Dr. Richard Weiss** from the Department of Biosciences spoke about nanoparticle formulations for skin vaccination.

The lectures were followed by presentations of the new BioNanoNet members ACIB GmbH - Austrian Center of Industrial Biotechnology (Austria), FLUIGENT Deutschland GmbH (Germany) and the Unit of Process Control and Informatics of the National Technical University of Athens (Greece).

Furthermore, BioNanoNet presented the updated strategy of the network, defining the core competences of BNN to support members and projects, as well as the areas and strategic goals for the years 2019 – 2024. As the European research & innovation strategies are opening new fields for science, research and innovation, it is a continuous challenge for the network and our members to keep pace with changing environment and conditions for our work. The strategy shall ensure that BNN is continuously a strong partner for our members and in projects.

The contribution of the EU-H2020 Infrastructures project *NanoCommons*, was highlighted under the Area “*Data & Sustainability*”. By means of the [Transnational Access \(TA\) activities](#), the users (nanosafety Researchers from industry, academia and regulatory bodies) get access to the state-of-the-art of [NanoCommons expertise](#) free of charge and take advantage of the NanoCommons services, facilities and knowledge to advance their work, solve problems and take their research to the next level: innovative solutions for data mining, harmonisation, utilisation and re-utilisation, including incorporation of a range of modelling and decision support tools that require organised high-quality datasets on which to run, provided via an Open Access, federated Knowledge Commons platform.

For more details about the projects and the TAs, please consult the [website of the project](#).

Supported by the presented competences and expertise of the new members, the networking part of the event enabled establishing new contacts for future cooperation.

The continuous growth of the network enables expanding the thematic horizon of Bio-NanoNet to the benefit of our members and thus supporting research and development activities in different branches. If you are interested to join BNN, please contact us (office@bionanonet.at).

Thank you especially to **Prof. Dr. Albert Duschl** for being a great host!



from the left: DI Erwin Kubista (JOANNEUM RESEARCH), Univ.-Prof. Dr. Nicola Hüsing (University of Salzburg, Department Chemistry and Physics of Materials & ACBN Research Centre), Assoc. Univ.-Prof. Dr. Richard Weiss (University of Salzburg, Department of Biosciences), Vice Rector for Research, Univ.-Prof. Dr. Fatima Ferreira (University of Salzburg), Univ.-Prof. Dr. Albert Duschl (Department of Biosciences & Research Centre ACBN, University of Salzburg), Andreas Falk, MSc (CEO BioNanoNet). © BioNanoNet



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement n° 731032 (NanoCommons Project).

[Click here to return to the table of contents](#)

Austrian Microfluidics Initiative (AMI) Workshop "Biomedicine on Chip"

11th of September 2019, Salzburg, Austria

BioNanoNet and PARIS LODRON UNIVERSITY OF SALZBURG organised the *Austrian Microfluidics Initiative (AMI) Workshop "Biomedicine on Chip"* on 11th of September 2019 at the premises of the University of Salzburg, attracting about 40 participants from both science and industry.

The event was officially opened by **Dr. Günter Lepperdinger** (PLUS) and Andreas Falk, MSc (CEO BioNanoNet). **Dr. Martin Fischlechner** started the scientific session with his introduction to the prototyping-FabLab "SPOC laboratories". Furthermore, he gave a presentation about "3D printing of biochips". **DI Barbara Bachmann** of the Institute of Applied Synthetic Chemistry at TU Wien presented the work done related to Biochip design and prototyping. **Dr. Michael Harasek** (TU Wien) gave insights in the University's activities in the field of "Fluidic Modelling". **DI Dr. Werner Haselmayr** from JKU Linz presented "New Perspectives on Droplet Microfluidics". **Univ. Prof. John W. C. Dunlop** from PLUS gave insights in the activities by the MorphoPhysics Group with his presentation on "Morphogenesis on Chip". **Roland Zauner, MSc** from the Centre of Expertise for Epidermolysis Bullosa (EB) and Special Clinic for "Butterfly Children" gave a presentation in "Plasma Separation-on-chip" and pictured how microfluidics could play a game changing role in the treatment EB patients. To conclude the series of talks, **Felix Spira** from Molecular Devices GmbH gave insights in the world of "*Advanced Cell Imaging*".

An important part of the workshop was to discuss future plans for collaboration towards an interdisciplinary knowledge and communication platform for the enhancement of competences in microfluidic technology, chip based analysis and data acquisition. To fully benefit

from the broad range of activities and services, join the network by contacting the Bio-NanoNet team (office@microfluidics-austria.at).

Thank you especially to **Dr. Günter Lepperdinger** for being a great host!

The Austrian Microfluidics Initiative (AMI) was launched by the Vienna University of Technology (TU Wien) in 2017 to bring together relevant engineering, analytical and biomedical expertise in Austria and bridge existing “research-to-product gaps” in microfluidics, lab-on-a-chip systems and organ-on-a-chip technology. The Initiative is supported by BioNanoNet and its strategic positioning is implemented by Austrian universities and industrial partners.

Univ. Prof. Dipl.-Ing. Dr. Peter Ertl is the spokesperson for the Austrian Microfluidics Initiative.

The goal of the Austrian Microfluidics Initiative is to (a) promote scientific collaborations between industry and academia, (b) support technology transfer activities, and (c) review future scientific challenges. Please visit www.microfluidicsaustria.at for further information.



from the left: Günter Lepperdinger, PhD (University of Salzburg, Aging Research, Stem Cell Biology, and Healthy Longevity Sciences), Dr. Michael Harasek (Technische Universität Wien, Institute of Chemical, Environmental & Bioscience Engineering). © BioNanoNet

[Click here to return to the table of contents](#)

BioNanoNet *Conference Calendar*

BioNanoNet on site events

NanoSafety Cluster Week "Building confidence in RA & governance of NM innovation"

When? 7 – 10 October 2019

Where? Copenhagen, Denmark

For more information visit the [BioNanoNet website](#).

Open Campus "Precision Medicine Day"

When? 22 October 2019

Where? Graz, Austria

Precision medicine integrates a global approach for disease diagnosis, treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. Precision medicine spans from genomics, biomarker research, multi-omics approaches to advanced therapy and diagnostics including bioinformatics, computational modeling and machine learning.

Programme

14.30 – 15.00 Registration & Coffee

15.00 – 15.15 Welcome & Introduction

Wolfgang Graier (Head of the Gottfried Schatz Research Center, Medical Univ. Graz)

Johann Harer (Human Technology Styria GmbH)

Susanne Resch (BioNanoNet Forschungs GmbH)

15.15 – 16.00 Precision Medicine at the Gottfried Schatz Research Center

"From genetic epidemiology to advanced therapy and computational modelling"

Helena Schmidt "Dissecting Human Aging by Genetic Epidemiology: The Graz Study on Health & Aging"

Ruth Prassl "Nanomedicine – Targeted Drug Delivery"

Gernot Plank "Digital Twin Models of Cardiac Function in Precision Cardiology"

16.00 – 16.45 "Next Generation Diagnostics in Precision Medicine"

Hans Peter Deigner (HS Furtwangen, Germany)

16.45 – 17.15 “How to Develop Biomarker for Precision Medicine”

Amin El-Heliebi (CBmed – Center for Biomarker Research in Medicine, Austria)

17.15 – 18.30 Networking & Buffet

For more information and registration visit the [Human.technology Styria website](#).

Pilot production lines for the health, transport and industry – EPPN workshop

When? 5 November 2019

Where? San Sebastian, Portugal

For more information visit the [BioNanoNet website](#).

SusChem-NTPs-meeting and Stakeholder-Event

When? 26 – 27 November 2019

Where? Brussels, Belgium

For more information visit the [BioNanoNet website](#).

ESGnano Think Tank

When? 3 December 2019

Where? Vienna, Austria

Save the date!

Workshop "Future proof approach of nanomaterials"

When? 4 – 5 December 2019

Where? Dessau, Germany

Save the date!

For all events visit our [BioNanoNet website](#)!

[Click here to return to the table of contents](#)

BioNanoNet Member-Event-Notifications

Workshop DIGI-B-CUBE

When? 7 November 2019, 9:00 – 13:00

Where? Linz, Austria (afo architekturforum oberösterreich, Herbert-Bayer-Platz 1)



Biobanking. Biosensing. Bioimaging. - "How digitalization impacts on the Medical Diagnostics Value Chain?"

For more details visit the [MTC-website](#).

Safe.Stable.Standardised.

How will we communicate tomorrow? In medicine. With medicine.



When? 7 November 2019

Where? Linz, Austria

Data is the new gold and must be protected and saved accordingly. It is healthcare in particular which needs safety standards for the exchange of information and the increasing number of medical devices being part of a network. After all the data of these devices is usually sensitive and often more desirable than credit card numbers.

This year's Digital.MedTech provides exciting impulses. Please expect and look forward to high-profile lectures and workshops relating to digital communication, secure communication, legally justified communication and protected communication.

For further information please visit our [MTC-website](#).

European Summit of Industrial Biotechnology

When? 18 - 20 November 2019

Where? Graz, Austria



You are active in industrial biotechnology and you are looking for something special? You always thought of an event that not only covers science but also deals with industrial needs and hopes, economic demands, funding resources or political aspirations and still leaves space for networking and recreation? The European Summit of Industrial Biotechnology (esib) is the European communication platform for industrial biotechnology. Stay tuned!

The ESIB is managed by acib – the Austrian Centre of Industrial Biotechnology – and its partners.

For more information please visit www.esib.at.

20 years Materials Center Leoben Forschung GmbH

... let`s celebrate:

When? 20 – 22 November 2019

Where? Leoben, Austria

The Materials Center Leoben Forschung GmbH invites existing and future partners from academia and industry, sponsors, stakeholders as well as alumni and employees to the celebration of its anniversary “**20 years MCL**” on Wednesday afternoon, 20 November 2019 in Leoben, Austria. Linked with this anniversary, the MCL is organizing an international conference “**IC-MPPE 2019**”. The conference aims to bring together partners from industry and university research institutes in the framework of the COMET research program "Integrated Computational Materials, Process and Product Engineering (IC-MPPE)".

[Event registration](#)





Joint Autumn Meeting on Extracellular Vesicles

When? 28 – 29 November 2019

Where? Freising-Weihenstephan, Germany

Austrian Society for Extracellular Vesicles (ASEV) – German Society for Extracellular Vesicles (GSEV) Joint Autumn Meeting on Extracellular Vesicles,

For more details visit: <http://www.asev.at/congresses.php> and <https://www.extracellular-vesicles.de/gsev-asev-autumn-meeting-2019/>

AICI forum Villach

When? 06 – 07 December 2019

Where? Congress-Center Villach, Europapl. 1, 9500 Villach

For more details visit the [HTS website](#).



[Click here to return to the table of contents](#)

Recent Scientific Publications of BNN Members

Period 2018

BioNanoNet

Schimpel, C., Resch, S., Flament, G., Carlander, D., Vaquero, C., Bustero, I., & Falk, A. (2018). A methodology on how to create a real-life relevant risk profile for a given nano-material. *Journal of Chemical Health and Safety*, 25(1), 12-23. DOI: [10.1016/j.jchas.2017.06.002](https://doi.org/10.1016/j.jchas.2017.06.002)

BOKU

Greßler, S.; Part, F.; Gzásó, A.; Nanotechnological Applications for Food Contact Materials (NanoTrust-Dossier 049en). *ITA Nanotruster Dossiers*, ISSN 1998-7293, 2018. doi: [10.1553/ita-nt-049en](https://doi.org/10.1553/ita-nt-049en)

Part, F., Zaba, C., Bixner, O., Grünewald, T.A., Michor, H., Küpcü, S., Debreczeny, M., De Vito Francesco, E., Lassenberger, A., Schrittwieser, S., Hann, S., Lichtenegger, H., Ehmoser, E.-K., 2018. Doping Method Determines Para- or Superparamagnetic Properties of Photostable and Surface-Modifiable Quantum Dots for Multimodal Bioimaging. *Chemistry of Materials* 30, 4233-4241, [10.1021/acs.chemmater.8b00431](https://doi.org/10.1021/acs.chemmater.8b00431).

Part, F., Berge, N., Baran, P., Stringfellow, A., Sun, W., Bartelt-Hunt, S., Mitrano, D., Li, L., Hennebert, P., Quicker, P., Bolyard, S.C., Huber-Humer, M., 2018a. A review of the fate of engineered nanomaterials in municipal solid waste streams. *Waste Management* 75, 427-449, <https://doi.org/10.1016/j.wasman.2018.02.012>.

Gressler, S., Part, F., Gzásó, A., Huber-Humer, M., 2018. Nanotechnological Applications for Food Contact Materials (NanoTrust Dossier No. 049en - July 2018, *ITA Nanotruster Dossiers*. Eigenverlag/Self, Wien.

Suzuki, S., Part, F., Matsufuji, Y., Huber-Humer, M., 2018. Modeling the fate and end-of-life phase of engineered nanomaterials in the Japanese construction sector. *Waste Management* 72, 389-398, <https://doi.org/10.1016/j.wasman.2017.11.037>.

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Fendl, B., Weiss, R., Eichhorn, T., Spittler, A., Fischer, M.B., Weber, V. (2019): Storage of human whole blood, but not isolated monocytes, preserves the distribution of monocyte subsets. *Biochem Biophys Res Commun*. pii: S0006-291X(19)31488-3. doi: 10.1016/j.bbrc.2019.07.120.

Short summary: We investigated the influence of different monocyte isolation protocols and storage on the relative abundance of monocyte subsets. Overnight incubation of isolated monocytes induced a change in the monocyte subset distribution towards CD14⁺⁺CD16⁺ intermediate monocytes, which were also the main binding partners of platelets and platelet-derived extracellular vesicles. Our data propose the involvement of platelet EVs in the induction of CD16 expression on monocytes.

Pilecky, M., Schildberger, A., Knabl, L., Orth-Höller, D., Weber, V. (2019): Influence of antibiotic treatment on the detection of *S. aureus* in whole blood following pathogen enrichment. *BMC Microbiol*, 19(1),180. doi: 10.1186/s12866-019-1559-7.

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Kardos, D., Marschall, B., Simon, M., Hornyák, I., Hinsenkamp, A., Kuten, O., Gyevnár, Z., Erdélyi, G., Bárdos, T., Paukovits, T.M., Magos, K., Béres, G., Szenthe, K., Bánáti, F., Szathmary, S., Nehrer, S., Lacza, Z. (2019): Investigation of Cytokine Changes in Osteoarthritic Knee Joint Tissues in Response to Hyperacute Serum Treatment. *Cells*, 8(8). pii: E824. doi: 10.3390/cells8080824.

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Further publications:

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[Click here to return to the table of contents](#)

Finally

We hope you enjoyed our BioNanoNet newsletter!
Please do not hesitate to contact us if you would like to give us
any suggestions or feedback!

Our next BioNanoNet newsletter will be published in December 2019.

BioNanoNet partners are welcome to send their contributions until 10th of December 2019!

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