ABSTRACTS BOOK

SURFBIO POLICY WORKSHOP

30 JUNE, 2023

ONLINE EVENT

Jožef Stefan Institute

SURF BIO

Surfbio project has received funding under the European Union's Horizon 2020 research & Innovation programme under grant agreement N° 952379

BOOK OF ABSTRACTS

POLICY WORKSHOP

Online event

June 20, 2023

Book of Abstracts: SURFBIO Policy Workshop

20 June, 2023 - online event

Organising committee: Jožef Stefan Institute, ICCRAM University of Burgos, AXIA Innovation, Wageningen University & Research, Helmholtz-Zentrum Dresden-Rossendorf.

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CONTENT

PREFACE

This policy proceedings book captures the references of a dynamic and collaborative policy workshop organized as part of the “SurfBio Innovation Hub for Surface and Colloid biology research”, European funded project under grant agreement Nº 952379.

Through close collaboration with national and international policymakers, industries, and stakeholders, we aim to shape material design solutions with (geo)political challenges, creating safe, sustainable, and cost-efficient applied developments and products and fostering excellence in science. The goal of this multi-collaborative approach is to establish an Innovation Hub in this pioneered field, providing high-quality research services and guidance to material designers, biotechnology researchers, academia, industry, and policymakers.

The policy workshop targeted three main topics: i) Education, ii) Safety and Safe and Sustainable by Design (SSbD), and iii) Standardisation and Intellectual Property Rights (IPR). The discussions lasted over 4 hours and embraced visions of the policy and strategy tendencies to tackle the existing global challenges. The outcomes and recommendations served to form a comprehensive framework for the establishment and future procedures of the SurfBio Colloid Biology Innovation Hub.

The attendees involved professionals from academia, research institutions, industry, and policy-making bodies, from public and private organisations at national and global levels. They engaged in vibrant debates and knowledge exchange to identify the key components that will boost the cell-surface discipline and position the Innovation Hub as an avant-garde platform, ensuring that the activities drive scientific excellence and applied advancements which are aligned with policies and strategies, in Slovenia and internationally.

The final part included success stories, sharing fruitful initiatives and accomplishments, intended at inspiring the SurfBio partners and all the attendees and seek guidance, exchange knowledge and stimulate future collaboration.

The policy proceedings book serves as a comprehensive record of the workshop, including the presenters and the summaries of each session.

Surfbio project has received funding under the European Union's Horizon 2020 research & Innovation programme under grant agreement N° 952379

ORGANISING COMMITTEE

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SPEAKERS

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POSITION

Project Manager at ITENE.

EDUCATION AND WORK EXPERIECE

Elena Barbero Colmenar is leading the nanomaterials projects at ITENE. Before, she has been working in a research laboratory at Rovira I Virgili University, where did her Ph.D under the supervision of Prof. Joan Rosell (Director of DEW group - Droplets intErfaces & floWs, URV, Tarragona). Her research focused on nanoparticle engineering, in particular, she worked in the production of small polymeric particles by electrohydrodynamic atomization, also known as electrospray. As a visiting researcher, she worked with Supercritical carbon dioxide technologies, under the supervision of Prof. Ernesto Reverchon and Dr. Lucia Baldino (Universitat degli Studio di Salerno). Elena has a bachelor's degree in chemical engineering and a Master's in Renewable Energies and Green Technologies.

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POSITION

Technical Director of ITENE.

EDUCATION AND WORK EXPERIECE

She has more than 20 years of experience in the management of R+D+i projects aimed at increasing the competitiveness of companies through innovation in packaging, transport and mobility, as well as in the design and implementation of strategies. innovation management and models for transferring research results to the business environment. She has a technical background as an Agricultural Engineer and a Degree in Food Science and Technology from the Polytechnic University of Valencia, an entity in which she received her PhD Cum Laude in 2015. Additionally, she has completed various Master's degrees, such as the MBA at ESTEMA or the Program of General Directorate of IESE. She leads the Technical Secretariat of the Spanish Technology Platform for Packaging and Packaging (PACKNET) and is the Coordinator of Group 1 of the Technical Committee for Standardization CTN49 – Packaging and Packaging. She is the coordinator of the European project Bionanopolys.

ILEANA MARÍA **GRECA**

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POSITION

Full Professor of Specific Didactics

EDUCATION AND WORK EXPERIECE

Director of an international and interdisciplinary consolidated Research Unit, recognized by the Junta de Castilla y León, focusing on the didactics of natural and social sciences and Art and heritage. Since 2021, she is Vice-Chancellor for Internationalisation and Cooperation at the University of Burgos and responsible for the RUN-EU Alliance at UBU. Her research interests include teacher professional development, integrated STEM approaches, the use of history and philosophy of science, and contemporary science topics.

LYDIA **GONZÁLEZ**

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POSITION

Spanish delegate at Horizon Europe

EDUCATION AND WORK EXPERIECE

Spanish delegate at Horizon Europe – Cluster 5 programme committee, in the area of Climate, and National Contact Point (NCP) in Cluster 6 "Food, Bioeconomy, Natural Resources, Agriculture and Environment", with a main focus on Natural Resources and Environment.

In relation with the European Missions within Horizon Europe, she is the Spanish delegate in the SPC subgroup for the Mission on "Adaptation to Climate Change" and the NCP as well.

Ph.D. in Physics and with a Master in Environmental Engineering and Management, after developing their scientific work at CSIC (Spanish National Research Council), she moved to work into industry. To highlight her experience working in LUCENT Microelectronics for 11 years. In 2003 she joined CDTI, the Spanish Innovation Agency answering to the Ministry of Science and Innovation, being linked to different international programmes that CDTI is managing (e.g. Eureka, Iberoeka) and from 2013 she has been working on the EU Research and Innovation Framework Programmes, Horizon 2020 and now Horizon Europe.

MARJETKA **KRALJ**
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POSITION
Quality and Regulatory Affairs Professional

EDUCATION AND WORK EXPERIECE
Postgraduate interdisciplinary doctoral study programme in Biomedicine, Faculty of Medicine, University of Ljubljana, Slovenia. Undergraduate study Microbiology at Biotechnical Faculty (University in Ljubljana, Slovenia).
Experiences gained with > 12 years employment at manufacturer of medical devices (Tosama) as a Microbiologist – establishment of microbiological laboratory, Project Manager – leading & management of research and development projects, Head of Quality Control / Regulatory compliance Dpt.
Recent role as a Lead auditor of Quality Management Systems according to ISO 13485:2016 and ISO 9001:2015, as well as knowledge on FDA QSR 21 CFR 820, expert for hygiene, cleanliness, sterilization, biocompatibility
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Recent role as a Lead auditor for MDD 93/42/EEC and MDR 2017/745,
Founder & owner of Timian consulting – a consulting company.
Co-owner of LegiRep d.o.o., Authorized representative company.

MARTA **SENDRA**
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POSITION
PostDoc at ICCRAM Toxicology research group

EDUCATION AND WORK EXPERIECE
In 2016 she moved to the University of Algarve to conduct research on the nanoplastics effects. In 2018, she got a Juan de la Cierva Formación Postodoctoral contract in Immunology and Genomics group from IIM-CSIC (Vigo). During this stage, she learnt new immunology and genomic approaches which she incorporated in her research field. She also got a Juan de la Cierva Incorporación contract in the ICCRAM-UBU University.
In the past ten years, Marta Sendra evolved into an internationally recognized expert in ecotoxicology and this is supported by publications with more than 25 international institutions from 13 different countries. Currently she is participating in three European projects and three Spanish National projects. Following Scopus index, she published 39 publications (35 articles and 4-chapter books), being first author of 23 of them all of them Q1 and more than 10 first decile.

PHILIP **MAURER**

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POSITION

Project Manager for Innovation – CEN and CENEL

EDUCATION AND WORK EXPERIENCE

Philip has worked for CEN and CENELEC at the Brussels Management Centre since 2021. He works as Innovation Project Manager, where he is responsible for different activities aimed at facilitating the integration of the standardization system with the research and innovation community. These include exploring new technologies ripe for standardization, supporting and developing European research framework projects, and interacting with researchers and innovators through events and workshops to propose opportunities for standardization.

He holds a Bachelor's degree in European Studies from Maastricht University, the Netherlands and a Master's degree in International Administration and Global Governance from the University of Gothenburg, Sweden. Previously he has been employed by the German Academic exchange service where he provided a supporting role to international education projects.

ROBERT **HARRISON**

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POSITION

Sonnneberg Harrison Partnergesellschaft mbH

EDUCATION AND WORK EXPERIENCE

Dr. Robert Harrison holds a B.A. in Physics from Oxford University and a M.Sc. in Solid State Physics from Sheffield University in the UK, he later obtained his doctorate in Electronic Engineering with a thesis in the field of Indium Arsenide Phosphide Antinomide. He was also European IP Counsel for W.L.Gore & Associates from 1995 to 2001.

He worked for the European Patent Office as an examiner before joining the intellectual property department of IBM where he trained as a German, and European Patent and Trademark Attorney. Robert Harrison is a member of the German Association of Engineers (VDI), the Institute of Engineering and Technology (IET), the Institution of Electrical Engineers (IEEE) and the Institute of Physics.

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POSITION

Associate Professor at Wageningen University & Research

EDUCATION AND WORK EXPERIENCE

Peter J. Schaap research Bioinformatics, Genetics, Genomics, Microbiology, Mycology, Microarrays, Transcriptomics, Fungi, Systems biology, Proteomics, Synthetic biology, Metabolic modelling, Big data, Digital twins in Wageningen University & Research (Netherlands) at Faculty of Agrotechnology and Food Sciences.

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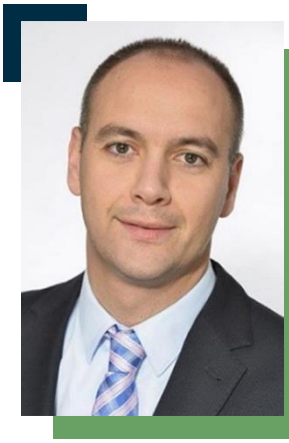
POSITION

Head of Colloid Biology Lab at Jožef Stefan Institute. SURFBIO project coordinator.

EDUCATION AND WORK EXPERIECE

Dr. Lapanje has a degree in biology and a PhD in Microbiology. He is the PI of the colloid biology group at Jožef Stefan Instiute, with more than 15 years of experience in environmental micorbiology and biotechnology. He has extended his expertise with training in phycial chemistry and colloid physics and has been involved in several national and international projects (FP7, H2020, Era). Curretly, he is the SURFBIO project coordinator and is establishing colloid biolgy as a new interdisciplinary field, connecting colloid chemistry and physics with biology and microbiolgy, genetics and biotechnology.



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POSITION

Project Manager Dept. of Soil and Groundwater

EDUCATION AND WORK EXPERIECE

Dr. Pérez de Mora has over 15 years of experience in environmental chemistry, microbiology and engineering. At TAUW he is leading multiple remediation projects for decontamination of soil and groundwater both for the private and public sector. Dr. Pérez de Mora is strongly involved in R&D, sustainability and innovation activities within TAUW. He is part of the international Environmental Risk Assessment Team and is currently coordinating TAUW's participation in two 2020 RIA Horizon projects (Greener and Biosysmo).

ABSTRACTS

LEGO MICROBES: THE COLLOID BIOLOGY APPROACH TO BUILDING A MICROBIAL COMMUNITY FOR SUCCESSFUL REMEDIATION OF THE ENVIRONMENT

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SURFBIO project's basis

In the environment, multimicrobial structures such as flocs, mats or biofilms are extremely well spatially organized in terms of microenvironmental conditions and metabolite exchange that allow the establishment of different niches within. However, structures are formed by chance and it is extremely valuable to develop a synthetic approach where structures can be manipulated in a way that are acting as catalytic cores. If they can be tailor assembled and maintained in biotechnological processes such as bioaugmentation during the bioremediation.

To assemble spatially oriented microbial cells within the consortium composed of different cells we need at least four components (4S): (i) Stickiness, a special "glue" to attach one cell to another and then promote their mutual interaction, (ii) Spatial, cells should be spatially oriented according to the design to exchange metabolites, (iii) Stable, structures should not disintegrate in the solution or solid matrix (e.g. soil) after the initiation of microbial growth and (iv) Scalable, a method must be upscaled for the use in the biotechnological systems.

To develop such synthetic structures we treated bacterial cells as colloidal particles to which we can approximate a zeta potential of about -40mV by the Smoluchowski equation. According to DLVO theory if we change the surface potential of one cell it will attach to the cell with opposite charge. By careful manipulation using a top-down approach we were able to prepare special structures enabling the combining of different bacterial cells, including strict anaerobes, forming stable planar or 3D structures. Until now we have successfully applied the "LEGO" approach in the preparation of catalytic structures for organic wastewater processing, metal precipitation from mine tailings, removal of micropollutants, prevention of biocorrosion and revalorisation of lignin wastes from the paper pulp industry.

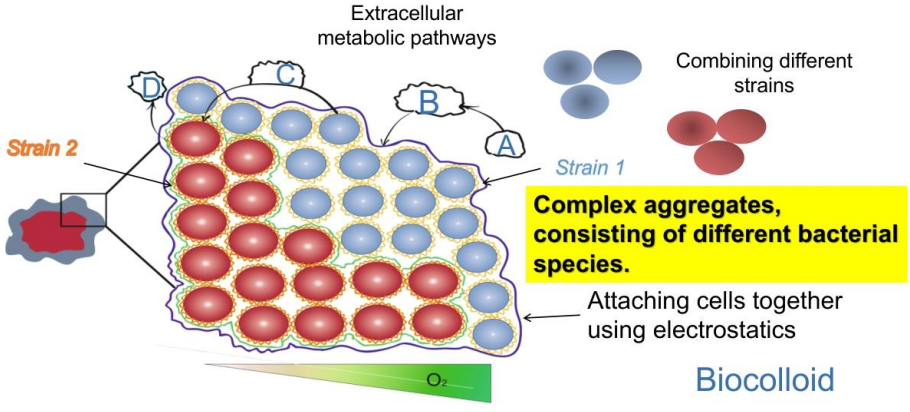

Figure 1. Biocolloid structure synthetically prepared using electrostatic approach to bring different strains in close interaction.

RUN-EU IS AN ALLIANCE

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Education, EU funds: strategies & opportunities

RUN-EU is an alliance of seven like-minded higher education institutions from all regions of Europe, established in 2020 under the European Universities Initiative. Together, they are creating a regional development-oriented European University that embodies the values of sustainability, multiculturalism, and inclusiveness in all its work.

University of Burgos recently joined this RUN-EU Alliance, what seeks to stimulate and create joint interregional education, research, innovation, and regional stakeholder engagement activities across the alliance around the Innovation Hubs of Future and Sustainable Industries, Bioeconomy, and Social Innovation.

The academic entities involved have been producing regionally relevant and globally impactful knowledge for over 50 years. In 2020, RUN-EU brought together researchers from across Europe to create unique inter-university research spaces.

HORIZON EUROPE. OPPORTUNITIES AND STRATEGIES FOR PARTICIPATION

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Education, EU funds: strategies & opportunities

Horizon Europe is the current EU Research and Innovation Framework Programme (2021-2027). Covering almost any research area, it is key to know the different opportunities that can appear in the annual work programmes identifying those calls and topics of greater interest, considering that colloid biology is an interdisciplinary field and the results of the research activities have many possible applications in different areas.

KEYWORDS

Horizon Europe. Research and Innovation. Circular Economy.

SAFE AND SUSTAINABLE BY DESIGN (SSbD)

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Safe and sustainable by design

Last December the European Commission published the first draft about Safe and Sustainable by Design (SSbD). In this document the European Green Deal and the Chemicals Strategy for Sustainability (CSS) have identified several actions to reduce the negative impacts on human and environment associated with chemicals, materials, products, and services commercialised or introduced onto EU market. The ambition of the CSS is to limit under regulation the most harmful substances and substitute them. Applying a SSbD methodology of chemicals and products will minimize the environmental footprint with safer, more sustainable, and functional new products. The principles of this framework are: green chemistry, green engineering, sustainable chemistry and circularity.

In this presentation will be identified and collected the bottlenecks in the step 1, 2 and 3 of the present framework. These three steps belong to the safety phase of the products: identifying the hazard properties of the products over the production, processing and application stages in consumer, workers, and environment.

The first step looks at the intrinsic properties of the chemical or material to understand their hazard potential before further assessing the safety during use. In the step 2 the health and safety aspects related to chemicals/materials production and processing will be addressed. It covers all processes: from raw materials extraction, production, processing, recycling and waste management; therefore, an Occupational Safety and Health (OSH) assessment will be addressed. In relation to step 3 the application/use-specific exposure to chemicals and the associated risks (human and environment) will be assessed identifying the exposure pathways according to a Chemical Safety Assessment.

KEYWORDS

Safety; Circularity; Functionality

REFERENCES

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SAFE AND SUSTAINABILITY BY DESIGN FRAMEWORK BIO-SUSHY

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Safe and sustainable by design

The European Green Deal has established four interlinked policy goals for the transition to a sustainable economy and society: climate neutrality, biodiversity protection, circular economy and a zero-pollution ambition for a toxic-free environment. To achieve these objectives, the Chemicals Strategy for Sustainability (CSS) calls for the transition to a Safe and Sustainable by Design (SSbD) approach for chemicals. The transition to chemicals and materials that are 'safe and sustainable by design' requires a common understanding of safety and sustainability aspects to be successful. Therefore, it is necessary to develop a European assessment framework for 'safe and sustainable by design' chemicals and materials, that can assist in the definition of safety and sustainability criteria.

The proposed SSbD framework can be applied to the development of new chemicals and materials or to the re-assessment of existing ones. This safety and sustainability assessment is composed of four steps and follows a hierarchical approach in which safety aspects are considered first, before moving on to sustainability aspects. In this manner, the first three steps mainly cover different aspects of the safety of chemicals or materials. The fourth step covers the environmental aspect of sustainability. Moreover, depending on how the SSbD framework is applied, it might also be beneficial to evaluate socio-economic sustainability factors, for example as a supplementary component to the major safety and sustainability assessments in the framework's use in the future.

In the BIO-SUSHY project, we consider this framework as a guide for the design and development of safe and sustainable novel coatings but, in addition to this, BIO-SUSHY will contribute to the definition of the criteria in terms of safety and sustainability needed for the development of SSbD strategies applied to novel PFAs free coatings.

ACKNOWLEDGEMENT

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More information: https://www.bio-sushy.eu

USE OF NANOMATERIALS FOR GROUNDWATER REMEDIATION

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Safe and sustainable by design

The use of nanomaterials for treatment of contaminated groundwater has gained significant relevance in the last 10 years. The applications include direct injection into the targeted contaminated section of the aquifer or incorporation to build a reactive permeable barrier downstream of the contamination source or plume. The ultimate goal is to create a reactive zone for transformation of the contaminants to non-toxic products or removal from the groundwater. Particularly, the use of nano zero valence iron (nZVI) and colloidal activated carbon has found significant commercial application for removal of toxic organic contaminants such as chlorinated compounds, mineral hydrocarbons or even per- and polyfluorinated compounds from groundwater.

Utilization of nanomaterials for groundwater applications at contaminated sites requires the obtention of a water permit from the local environmental authorities. For this purpose appropriate documentation on the nanomaterials has to be presented regarding their purpose and mobility within the aquifer as well as their proven effectiveness and ecotoxicological information. Generally, successful performance of treatability studies with site materials at lab scale in batch reactors and/or in packed columns is a pre-requisite to show the feasibility of the nanomaterials for groundwater treatment and provide a solid basis for scaling-up to a field setting. In addition, a monitoring concept to follow the fate of the nanoparticles in the aquifer in space and time is needed.

Due to their colloidal nature nanomaterials offer unique characteristics to provide a higher treatment efficiency (higher radius of influence and surface to volume ratio) than micromaterials. Yet, the production costs for nanomaterials need to be improved to successful compete against other non-nano technologies. Furthermore, standardized methods for detection and monitoring of nanomaterials in the environment are needed to evaluate their impact at large scale and increase their acceptance by stakeholders and regulators. Collaborations at early developmental stages with industrial partners is an important milestone to facilitate future applicability and commerciality of the nanotechnology and obtain additional funding support.

FROM IDEA TO THE MARKET APPROVAL – REQUIREMENTS OF EU LEGAL FRAMEWORK FOR MEDICAL DEVICES, TISSUE AND CELLS, MEDICINAL SUBSTANCES

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Standardisation, Metrology, IP and Registration

Regulatory requirements for medical devices and other regulated products, such as tissue or medicinal products, are demanding and impact the path to the market. This one is long and exhaustive, of course. All begin with an idea, which is usually followed by a basic research and can turn into a real project journey. But it is not an easy one, as a path is narrow and goes up. Up in a way of years to market the product, and also to hundreds of thousands (sometime millions) of euros. One of the significant challenges in such a project represents regulatory requirements. These are similar in a global aspect, but also different and specific, as the products differ. For a medical devices and in vitro medical devices in EU area applies the Regulation (EU) 2017/745 and 2017/746, respectively. Tissue safety is assured with Directive 2004/23/EC of the European Parliament. This directive sets standards of quality and safety for the donation, procurement, testing, processing, preservation, storage and distribution of human tissues and cells. The most known and complex is legislation relating to medicinal products for human use – in Europe the requirements are compiled in Directive 2001/83/EC. This directive covers different medicinal substances: form biologics, which are derived from living sources, including humans, other animals, bacteria, and viruses to vaccines and monoclonal antibodies, other therapeutic chemical substances. All the mentioned legal framework are demanding and enable marketing the products only after approval of regulatory authorities. The success awaits only the most persistent research teams. But it is very helpful, when academic centres and research institutions in the early development phase acquire the knowledge on regulatory aspects, as such an approach may help speed the whole process.

KEYWORDS

Medical Device Regulation; Tissue; Medicinal substances Market approval; Product Compliance

REFERENCES

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Regulation (EU) 2017/746 of the European Parliament and of the Council of 5 April 2017 on in vitro diagnostic medical devices and repealing Directive 98/79/EC and Commission Decision 2010/227/EU.

Directive 2004/23/EC of the European Parliament and of the Council of 31 March 2004 on setting standards of quality and safety for the donation, procurement, testing, processing, preservation, storage and distribution of human tissues and cells.

Directive 2001/83/EC of the European Parliament and of the Council of 6 November 2001 on the Community code relating to medicinal products for human use.

INTRODUCTION TO STANDARDIZATION SYSTEM AND THE ROLE OF STANDARDS IN RESEARCH

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Standardisation, Metrology, IP and Registration

Innovation is paramount in the world of today and tomorrow: the ability to develop new technologies and have them quickly access the market determines who wins or loses in the global economy. In this rapidly changing technological environment, standardization has a fundamental role to play. Standards and standardization are recognized as tools for promoting innovation for both policymakers and businesses, as standards allow codifying knowledge and making it accessible to a wide range of stakeholders.

This presentation will first offer an introduction to standardization as a whole and the European Standardization system and the role of the European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC).

The speech will also explain the benefit of integrating standardization with research and innovation activities, showing how standardization creates a foundational framework for innovative and impactful solutions to support the implementation of EU Research and Innovation programmes, as well as recommendations for project partners on how to best implement standardization into their research project.

KEYWORDS

Standardization; Interoperability; CEN and CENELEC; Norm

BIONANOPOLYS JOINT ENTITY SET UP TO SUPPORT COMPANIES IN BRINGING BIONANOMATERIALS TO MARKET

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Success stories

The international association that will manage the Single-Entry-Point (SEP) of the BIONANOPOLYS project has been formally constituted and will be able to support companies across the European Union in the market introduction of bionanomaterials through technical, legal, regulatory, safety, economic and financial support services.

The SEP was established as an AISBL (non-profit entity) on 17 February 2023 in the framework of the European project BIONANOPOLYS, funded by the Horizon 2020 programme.

The BIONANOPOLYS SEP will reduce the risks and barriers to the commercial exploitation of bio-based materials and polymeric bionanocomposites with nanotechnology and accelerate market penetration and innovation processes.

SMEs, large companies, and potential customers who are users of the BIONANOPOLYS OITB (Open Innovation Test Bed) will be able to access the services offered by the project partners through this entity, which will act as a one-stop shop, at affordable costs and conditions.

The test bed consists of 14 enhanced pilot plants and complementary services to support technological and commercial breakthroughs. Collaboration between all the partners that make up BIONANOPOLYS and access through the SEP allows joint access to all the services offered by the partners and helps to drive collaborative open innovation.

The SEP governance model will be validated in the Open Call: project partners will be in charge of evaluating the projects submitted to the BIONANOPOLYS platform once the open call launched last February to select five projects from different European countries that will be able to access its services free of charge to develop, test or scale-up bionanomaterials in the BIONANOPOLYS OITB closes.

For more information a catalogue of all the services has been developed and a clear and solid applicants guide has been drawn up to boost the dissemination and explain the Open Call procedures.

UNLOCK, A LARGE-SCALE INFRASTRUCTURE FOR RESEARCH ON MICROBIAL COMMUNITIES

Schaap P[1], Langenhoff A[1], Kleerebezem R[2], Koehorst J[1], Atasoy M[1], Stouten G[2] and Smidt H[1],
UNLOCK Large Scale Infrastructure for Microbial Communities[1,2].

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Success stories

BACKGROUND

Microbial communities perform vital roles affecting our health to global greenhouse gas emissions. Many of the key-microorganisms of these communities depend on symbiotic interactions for growth, which makes them difficult to study and explore in isolation. Efficient research on microbial communities is hampered by three major technical limitations: (i) the lack of high-throughput cultivation facilities for comparative analysis of microbial ecosystems in parallel, (ii) the effective integration of these cultivation studies with molecular systems characterizations, and (iii) a tight integration and transparent and uniform storage and processing of the generated data.

THE UNLOCK INFRASTRUCTURE

By addressing these limitations, UNLOCK enables research on mixed microbial communities at an unprecedented scale and efficiency. Wet lab experiments and computational simulations are both vital to the research and development process. The Unlock research infrastructure (Figure 1) is composed of three complementary experimental platforms for high-throughput discovery and characterization of microbial communities integrated with a FAIR data platform

The FAIR data platform is equipped with an up-to-date computational ecosystem of robust state-of-the-art open-source tools for data handling, information retrieval, statistical analysis, and visualization of Omics data. The iRODS open-source data management system is used to manage data and metadata storage. Omics analysis pipelines are containerized and written in the Common Workflow Language (CWL) Semantic web techniques are used for automatic data handling and data FAIRification (Figure 2).

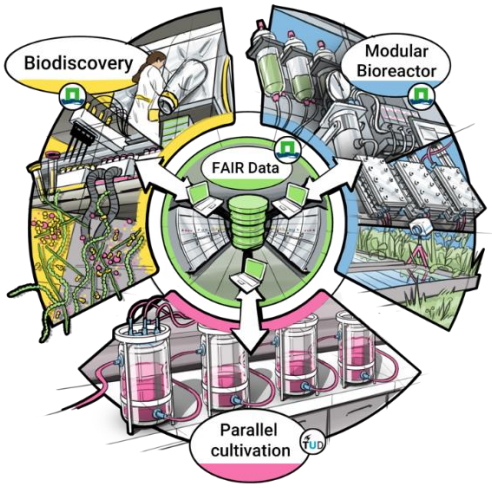

Figure 1. Overview of the Unlock Infrastructure.

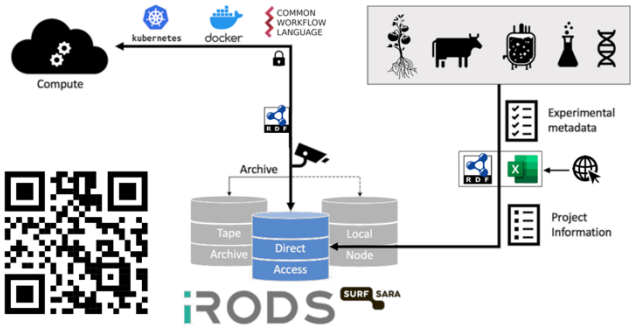

Figure 2. FAIR data platform technical details. Experiment metadata is used to program the iRODS DMS to store data in designated folders along with the metadata. Data transformation and analysis is done using containerized applications. Kubernetes is used manage container deployment. **QR-code: https://m-unlock.nl**

REFERENCES

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Jožef Stefan Institute

SURFBIO

The Jožef Stefan Institute is the leading Slovenian scientific research institute, covering a broad spectrum of basic and applied research. The staff is made up of more than 850 specialists in natural sciences, life sciences and engineering.

The mission of the Jožef Stefan Institute is the accumulation - and dissemination - of knowledge at the frontiers of natural science and technology to the benefit of society at large through the pursuit of education, learning, research, and deve-lopment of high technology at the highest inter-national levels of excellence.

The Laboratory for Colloid Biology is working on the new discipline focused on the study of the interaction between different microbial cells and between cells and surfaces. The research in this field might give scientific community a completely new tool for manipulation of structures of bacterial communities.

From the Jožef Stefan Institute, Sloveniaś leading scientific research institute, together with five top research & innovation partners across Europe, SURFBIO project partners are creating an Innovation Hub to study micro-be–surface by using high-tech methodologies and equipment

SURFBIO project aim to provide researchers, academic institutions, industry and policy makers with training services and assessments to optimise novel materials for a variety of applications. Understanding the interactions of the colloids (microorganisms and biomolecules) with surfaces and between themselves is a key factor that can lead to improvements in several fields, such as the biotechnology industry or the development of nano-carriers for drug delivery. These interactions can be studied and analysed by applying different tools and techniques, and this is the SURFBIO main objective.

HZDR HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF

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