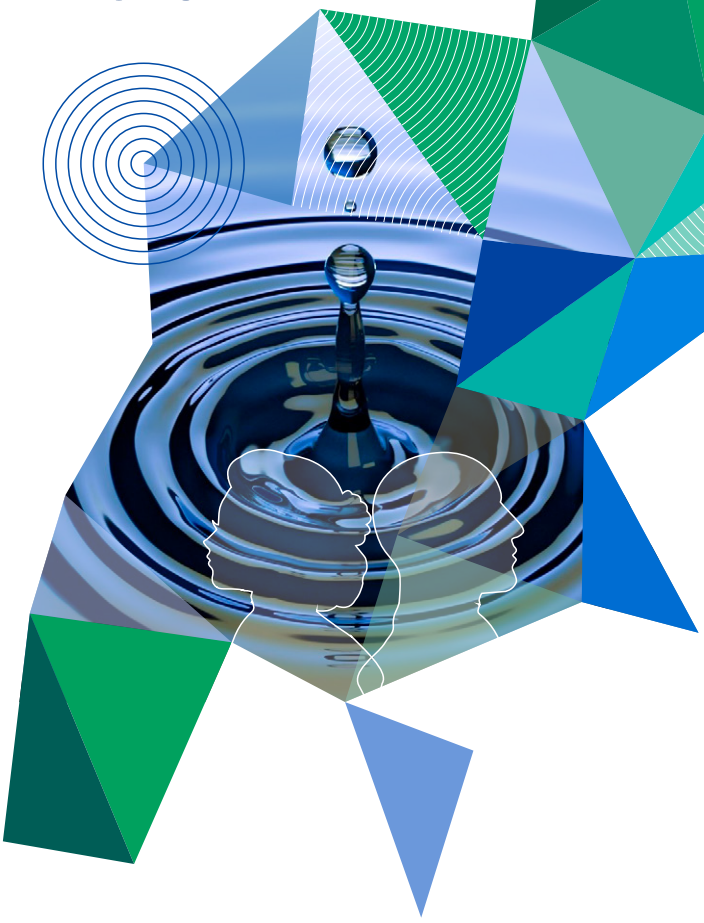
Join our European research networks

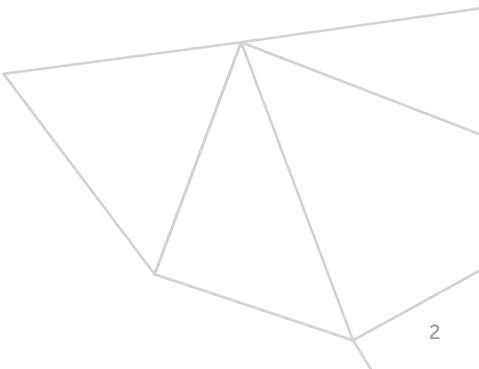
2023



cost
EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

INTRODUCTION

COST ACTIONS



About us

Growing ideas through networks

The European Cooperation in Science and Technology (COST) is a European intergovernmental framework which funds interdisciplinary research networks. These networks, called COST Actions, provide open spaces where researchers and innovators can connect, collaborate, and build their ideas together.
Since its creation in 1971, COST has been the leading networking tool in the European Research Area and aims at strengthening Europe's capacity to address scientific, technological, and societal challenges.

COST has three strategic priorities:

- **Promoting and spreading excellence**
- **Fostering interdisciplinary research for breakthrough science**
- **Empowering and retaining young researchers and innovators**

Once a year the COST Open Call collects proposals in any science and technology field. COST gives researchers the opportunity to create networks based on their own research interests and ideas. COST Actions are highly interdisciplinary, open (it is possible to join ongoing Actions), and have multi-stakeholders (e.g. private sector, policymakers, civil society, etc.).
COST's funding exclusively covers collaboration activities with the intention to complement national research funds.
COST enhances the mobility of researchers across Europe and beyond encouraging scientific excellence. By anticipating and complementing the activities of other EU framework programmes, COST acts as a bridge for less-research-intensive communities in COST Members defined as Inclusiveness Target Countries.

What is a COST Action?

A COST Action is a network:

- open for researchers and innovators;
- promoting collaboration in a field of science and technology of common interest to the COST Members;
- based on a joint work programme lasting four years;
- answering to the COST Open Call for proposals.

A COST Action is open to:

- all fields of science and technology (including interdisciplinary, new and emerging fields);
- all types of institutions (academia, public institutions, SME/industry partners, NGOs, European/international organisations, etc.);
- all career stages (both young and experienced);
- all COST Members, as well as Near Neighbour Countries[1] (eligible for COST support) and Third States[2] (International Partner Countries).

The COST programme does not fund research but provides support for networking activities carried out within COST Actions – find out more about them on page 9. Participants of a COST Action can therefore collaborate through a range of networking activities, such as meetings, conferences, workshops, short-term scientific missions, training schools, virtual mobility, conference grants, dissemination and communication products.
The average budget of a COST Action is indicatively EUR 150,000/year for a typical network with participants from 30 COST Full/Cooperating Members. In this booklet you will find a wide range of COST Actions that can be joined at any time.

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1 Algeria, Azerbaijan, Belarus*, Egypt, Jordan, Kosovo**, Lebanon, Libya, Morocco, Palestine***, Russia*, Syria, Tunisia.
* Measures are taken to suspend cooperation with Russia and Belarus as of 6 May 2022 and as of 2 March 2023 respectively and until further notice. Among these measures, participation and eligibility of COST Action participants affiliated to a legal entity established in Belarus or in Russia are suspended for all COST Actions and COST activities.
** This designation is without prejudice to positions on status and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.
*** This designation shall not be construed as recognition of a State of Palestine and is without prejudice to the individual positions of the Member States on this issue.

2 Third States are countries from any of the seven continents, Asia, Africa, North America, South America, Antarctica, Europe, and Australia, that are not included in the lists of COST Members or COST Near Neighbour Countries.

Two ways of joining the COST programme

A. Submit a proposal for a COST Action

A COST Action proposal can be submitted at any time. Proposals are collected once a year. The submission, evaluation, selection, and approval (SESA) procedure ensures a simple, transparent, and competitive evaluation and selection process, in line with COST's bottom-up, open and inclusive principles.

Proposers benefit from a one-stage submission via the e-COST online tool. The proposal requires filling in a few sections online and uploading a technical annex of up to 15 pages.

A proposal evaluation includes:

- a remote peer-review evaluation by three independent external experts;
- a review and validation of the evaluation reports by ad-hoc review panels. Their composition is tailored to the topics of the proposals received in a collection. Their members are selected from a pool of experienced researchers from COST Members;
- a selection of final proposals by the Scientific Committee (composed of independent, high-level experts).

The selected proposals are approved by the Committee of Senior Officials (governance of the COST Association).

COST Actions can benefit from training and webinars through the COST Academy[3].

For more information please read the Open Call webpage.

3 The COST Academy offers dedicated training to Action leadership roles (Action Chairs, Grant Holder Managers and Science Communication Coordinators) and webinars for all COST Action participants.

B. Participate in an existing COST Action

There are different ways of participating in a COST Action:

1. As a Working Group member

Working Groups perform the tasks to fulfil the objectives of the network's project plan, as described in their Memorandum of Understanding[4]. To participate as a Working Group member, contact the Action's Chair or the Management Committee (MC) member(s) from your country to discuss your potential contribution. Apply for Working Group membership on the list of COST Actions in the website.

2. As a participant in COST Actions' activities

During their lifetime, Actions provide opportunities to get involved in activities through training schools, short-term scientific missions, workshops, conferences, etc. To participate in one of these, follow the offers on the listing page of the Action you are interested in or get in touch with the Action's Chair or the MC member of your country.
In addition, you may wish to represent your COST Member, liaise with the scientific community in your country and be responsible for the coordination, implementation and management of an Action. In that case you can ask the COST National Coordinator of your country to nominate you as MC member. For each Action, up to two representatives per COST Member can be nominated to the MC.

Where to find all that information?

Go to the COST webpage, search for the Action you are interested in: for each Action you will find contact details for the Chair, the Working Group leaders, the national MC members and a link to the Action's own website.

4 The Memorandum of Understanding for each COST Action is available on the COST webpage under the Action code.

COST Action networking activities

1. Meetings, workshops and conferences

Meetings are organised by MCs in any COST Member participating in the network. They can be of different types, such as MC meetings, working group meetings, workshops or conferences. They may be open to the wider community and provide opportunities to enhance the COST Action's visibility. COST will contribute to the travel and subsistence expenses of the invited participants as well as to the expenses of organising the meeting.

2. Short-term scientific missions (STSMs)

These scientific missions allow researchers involved in a COST Action to visit an institution or laboratory in any country in the world participating in the Action. Their aim is to foster collaboration and share new techniques and research infrastructure that may not be available in a participant's home institution or laboratory. STSMs provide a good opportunity for both young and experienced researchers looking for mentoring and lifelong learning.

3. Training schools

Training schools offer intensive training on an Action topic at the premises of one of the Action participants. Trainees are typically, but not exclusively, young researchers from across Europe. These schools can also offer researchers from any career stage, lifelong learning opportunities.

4. Conference Grants

These grants are aimed at young researchers from Inclusiveness Target Countries and help individuals attend beneficial international conferences that are not organised by COST Actions.

5. Virtual Networking Grants

COST has developed two new types of grants to fill the rising need of digital tools to ensure continuity of COST Actions' activities:

- Virtual networking support (VNS) grants.
  These grants aim at promoting virtual collaboration to complement traditional ways of collaboration within the research and innovation communities;
- Virtual mobility (VM) grants.
  These grants aim at strengthening the existing networks by allowing researchers to foster collaboration in a virtual setting, to exchange knowledge, learn new techniques, disseminate, and share the Action results.

6. Communication, Dissemination and Valorisation strategy

The sharing of scientific results is vitally important in strengthening science and research. Due to the value and impact communication and dissemination activities can have on the wider research community, COST actively encourages and supports Actions to share outcomes with researchers, policymakers, the private sector and civic society such as NGOs. Dissemination and communication channels are available for the Actions, such as dissemination grants, publications, online and social media, news releases, events, success story releases, dissemination meetings, etc.

More information about the networking activities and their eligible cost can be found in the Annotated Rules for COST Actions.

How to find your Action in this booklet

This booklet includes 264 Actions that can be joined at any time before the end of the network's funding period. To help you identify specific research fields within each group of Actions, the table on page 10 shows the scientific fields by the Organisation for Economic Co-operation and Development (OECD) covered by each COST Action.
We recommend you consider the scientific fields that match your research background or your interest and read the abstracts of the Actions belonging to those fields. Alternatively, you can also find Actions of your interest keywords on COST website.
You can find out more information about Actions included in this booklet on the COST webpage -and on Actions' individual websites indicated after each Action's abstract.

COST National Coordinators

The COST National Coordinators are the national contact points in the various countries that are a Member of COST. They are typically employed by the national ministries, responsible for research and innovation, or national research agencies. COST National Coordinators appoint the national participants to COST Actions, which gather in the Management Committees of COST Actions. Also displayed on this page are the national contact points for COST's Cooperating Member, Israel and COST's Partner Member, South Africa.

COST Actions starting in 2023
(and finishing in 2027)

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA22101					■		14
CA22102	■	■					15
CA22103		■	■				16
CA22104	■				■		17
CA22105	■			■			18
CA22106	■	■	■			■	19
CA22107	■						20
CA22108	■						21
CA22109			■	■			22
CA22110					■		23
CA22111	■		■		■		24
CA22112	■	■		■			25
CA22113	■						26
CA22114			■				27
CA22115						■	28
CA22116						■	29
CA22117	■						30

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA22118			■				31
CA22119	■		■				32
CA22120					■		33
CA22121					■		34
CA22122				■	■		35
CA22123		■					36
CA22124	■				■		37
CA22125			■				38
CA22126						■	39
CA22127			■		■	■	40
CA22128					■	■	41
CA22129	■						42
CA22130	■						43
CA22131	■						44
CA22132	■	■					45
CA22133	■						46
CA22134				■			47
CA22135	■				■		48

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA22136	■	■		■			49
CA22137	■	■					50
CA22138		■					51
CA22139			■		■	■	52
CA22140	■			■			53
CA22141				■			54
CA22142	■			■			55
CA22143	■	■					56
CA22144	■			■	■		57
CA22145	■					■	58
CA22146			■	■		■	59
CA22147	■	■					60
CA22148	■						61
CA22149					■	■	62
CA22150					■		63
CA22151	■	■					64
CA22152			■				65
CA22153	■	■					66

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA22154	■	■					67
CA22155	■	■		■		■	68
CA22156					■	■	69
CA22157	■			■			70
CA22158	■			■			71
CA22159						■	72
CA22160		■		■	■		73
CA22161	■	■					74
CA22162	■						75
CA22163				■			76
CA22164	■			■			77
CA22165					■	■	78
CA22166				■			79
CA22167					■		80
CA22168	■	■					81
CA22169			■				82
CA22170		■	■				83

Cultural Expertise Junior Network

CHAIR: Prof. Livia Holden (FR)
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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

K-Peritia proposes an unprecedented network of junior experts who have preliminary experience as experts in court, members of the legal professions who are interested in cultural expertise, senior scholars with experience of expert witnessing and representatives of key international organisations, NGOs and capacity building institutions. The challenges of K-Peritia are 1) developing an international network for bridging the gap between the supply and the demand for professional cultural expertise which overcomes elitist and expensive features; 2) enabling the professional engagement of junior experts; and 3) digitalisation of the knowledge on cultural expertise. These three challenges will articulate on a newly designed transdisciplinary platform: a multilingual, open access, and cross-jurisdictional socio-legal database. The Action will foster transdisciplinary collaboration among the various disciplines of the social sciences; will establish cultural expertise more firmly as a research category in all the countries of this network, foster a better collaboration among experts and the legal professions and encourage the professional engagement of junior experts, and create the instruments for the adoption of cultural expertise which are respectful of the ethics and the deontologies of the involved professions. The deliverables of K-Peritia will be the launch of Cultural Expertise Digital Network including a training manual of use-cases for an extended use of the socio-legal database; a system of experts' accreditation; training and capacity building module; a volume on cultural expertise and conflict resolution; and country specific policy-making guidelines on the adoption of cultural expertise also including a guide for non- discriminatory language in litigation.

European Network In CHEmical Ecology: translating the language of life into sustainability

CHAIR: Dr Anne-Geneviève Bagnères-Urbany (FR)
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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

E-NICHE will help unify the different branches of chemical ecology (CE) by bringing together researchers who study natural compounds that can act as semiochemicals (i.e., communication signals). At present, collaborations among these researchers are limited because CE is an extremely fragmented field. E-NICHE will foster partnerships between

(a) scientists studying aquatic and terrestrial ecosystems; (b) natural products chemists, biochemists, and ecologists; (c) vertebrate biologists and entomologists; (d) plant and animal biologists; (e) zoologists and molecular biologists; and (f) neurobiologists and microbiologists. Their interactions will generate original ideas and perspectives while simultaneously meeting societal needs, a challenge that involves the creation of new chemical formulations, novel molecules, and innovative applications for natural compounds. This work will be nourished by a deeper understanding of the living world through the lens of chemical mediation, the main system of biological communication. It will also aim to prevent the loss of the chemical biodiversity found in nature, under threat because of global changes. Consequently, E-NICHE's overarching objective is to establish a strong, extended European CE network that catalyses international, interdisciplinary, and cross-sectoral exchanges with a view to building knowledge and intergenerational sustainable development solutions. Via the new network created by E-NICHE, researchers will broaden their breadth of knowledge, define new research directions, and transform their discoveries into pioneering solutions.

A COMPREHENSIVE NETWORK AGAINST BRAIN CANCER

CHAIR: Prof. Xinzhong Li (UK) x.li@tees.ac.uk

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

It is estimated that 3.24 million new cancer cases and 1.66 million cancer deaths will be registered across Europe in 2024 and 40,800 of these deaths are from brain and central nervous system (CNS) cancers. Despite extensive efforts in molecular biology research, advances in biomedical engineering, artificial intelligence (AI) and big data science, brain tumours remain among the deadliest forms of cancer, resisting almost all conventional and novel treatments. To date, we do not fully understand the behaviour of this devastating disease, let alone the cause. To cure brain cancer, there are significant challenges in the early diagnosis, prognosis and patient stratification, drug development and drug resistance, and big data techniques. Addressing these challenges requires long-term continuous efforts and multidisciplinary collaboration.

This COST Action aims to significantly facilitate the translation of fundamental scientific discoveries into better clinical treatment and management of patients suffering from brain cancer. This aim will be pursued through the following main objectives: 1) to build a unique pan-European and multidisciplinary network focusing on brain cancer by combining state- of-the-art knowledge and innovative techniques; 2) to promote education and training in the areas of advanced neuroscience, neuroimaging, genetics and molecular biology, big data and computational techniques for the accurate early diagnosis, prognosis, patient stratification and treatment of patients with different types of brain cancer; and 3) to build an integrated pan-European brain cancer database and biobank platform for the benefit of the research and clinical community.

Behavioral Next Generation in Wireless Networks for Cyber Security

CHAIR: Dr Valeria Loscri (FR) valeria.loscri@inria.fr

FUNDING PERIOD: September 2023-September 2027

SUMMARY

The always-connected world we are living in, gives us an unprecedented plethora of new advanced services and automated applications requiring, more and more, less human intervention due to the increased integration of Machine Learning (ML), Artificial Intelligence (AI) approaches and sophisticated emerging wireless technologies.

On the other side, this connected world opens new breaches and creates new potential vulnerabilities for smart advanced cyber-attacks, namely attacks and offender relying on ML/AI and advanced wireless technology integration, to make their attack more effective and less detectable. If an increasing awareness by the users, could help to contrast the security issues, it is not sufficient against the new generation of cyber-attacks. In this context, a drastic paradigm shift, putting human-being in the loop for the conception of novel and more effective cyber-security solutions, must be considered.

On the other hands, human-beings have a double role in the cyber-connected world: as potential offender and potential victim. In BEiNG-WISE, we aim to focus on how these different human-being features can be combined with the advanced technological characteristics, in order to conceive non-conventional, responsible by design, cyber- security solutions accounting for both these factors. In this complex connected system, another fundamental aspect that need to be accounted to, is the legal aspect, related to the conception of solutions that can be effectively employed in the real world. Also the legal aspects should be considered at the design stage. This project relies on cross- domains expertise, ranging from cyber security, wireless communication technology, data science, sociology, psychology and lawyers.

BEekeeping products valorization and biomonitoring for the SAFEty of BEEs and HONEY

CHAIR: Dr Andreia Freitas (PT) andreia.freitas@iniav.pt

FUNDING PERIOD: September 2023-September 2027

SUMMARY

Since ancient times, honey has been a popular functional food due to its healthy properties based its bioactive compounds composition with antioxidant, antimicrobial, anti- inflammatory, and anticancer properties. Furthermore, the European honeybee, Apis mellifera, is the most important pollinator, crucial for food and plant production in general. However, bees are in decline, being threatened to extinction in Europe due to anthropogenic activities, including agriculture intensification and pesticide application. This have led to reduction of honey production with 40% of EU consumption being imported.

Traying help and ameliorate honeybee colonies, the present groundbreaking network will deliver cooperation between international wide range beekeeping stakeholders and the innovative results will be related to the following topics:

- Honey and by-products nutritional and medicinal properties.
- Abiotic stressors and anthropogenic contaminants in the environment using hive products as indicators.
- Prevalent diseases and biotic stressors threatening honeybee colonies.
- Honeybees as pollinators in agriculture and consequences of lost colonies in agrarian ecosystems.

Policy research and market analysis related with beekeeping activities. BeSafeBeehoney, with a multi-actor approach, will bring together distinct expertise – chemistry, biology, ecology, veterinary, beekeeping, agrarian engineering, nutrition, economy, and policy to deliver breakthrough scientific developments. The importance of beekeeping is in line with SDG2, 12 and 15, aiming the promotion of sustainable agriculture, quality production, and sustainable use of terrestrial ecosystems. The SDG5 seeking to achieve gender equality while still a constant challenge, in this team more than half of the members are women, young researchers and belonging to inclusiveness target countries.

Migrant Disaster Victim Identification

CHAIR: Prof. Caroline Wilkinson (UK)
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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Illegal immigration is currently a global problem and economic migration is a critical issue for many European countries. Many thousands of migrants reach the end of their lives attempting to cross bodies of water and inhospitable land masses between continents/countries. The European Commissioner for Human Rights (2007) argued that it was imperative to begin a process to identify and account for the thousands of 'missing' undocumented migrants whose identities are unknown. However, despite the frequency and magnitude of these tragedies over the last ten years, European governments have been slow to recognise that families have a right to know the fate of missing migrant relatives. It is, therefore, an international moral necessity to try to identify each person for family/legal matters, and this is especially challenging where the country of origin is poor or war-torn, where identification details are absent and migration is undocumented and unmonitored. This is a global humanitarian crisis.

Current MDVI processes have been inadequate and underfunded – only 22% of deceased migrants are ever identified. This is partly caused by a lack of communication between countries of origin and arrival and relevant stakeholders – policy makers, forensic practitioners, humanitarian groups, and government bodies – whereby advances in identification technologies have not delivered their full potential in this field. In the proposed Action, interdisciplinary research and coordinated initiatives (meetings, training schools, short term scientific missions and online resources) will drive the development and validation of international processes and resources, including the utilisation of innovative craniofacial, drone and social media methods.

Bringing Experiment and Simulation Together in Crystal Structure Prediction

CHAIR: Dr Ivo Rietveld (FR) ivo.rietveld@univ-rouen.fr

FUNDING PERIOD: September 2023-September 2027

SUMMARY

The physical and chemical stability of organic molecules is important for the rational design and development of fine chemicals (e.g., pharmaceuticals and agrochemicals). Crystal structure prediction, the computational generation of crystal structures and energy rankings, has become an important tool in finding crystalline forms and determining their relative stability; however, despite the large quantity of thermodynamic data in the literature, no well-defined benchmark of equilibrium data of crystalline polymorphs of pharmaceutical and other technically important molecules exists against which computational results can be validated. Through this Action, a set of benchmark compounds will be established through tight collaboration between experimental and computational scientists. The Action will result in a standard against which computational methods can be tested and validated in the future. Moreover, the Action will organise a blind test similar to the computational crystal structure prediction test organised by the Cambridge Crystallographic Data Centre, but with a focus on thermodynamics and the prediction of physical properties. The close-knit collaboration will be fostered by educating PhD students in both computational and experimental disciplines to secure an optimal synergy between them, will advance the general understanding of crystalline polymorphism, and will facilitate formulation processes dealing with polymorph stability in industry.

Wildlife Malaria Network

CHAIR: Dr Jenny Dunn (UK) JDunn@lincoln.ac.uk
FUNDING PERIOD: September 2023-September 2027

CA22108

SUMMARY

Vector-borne diseases, and emerging infectious diseases of wildlife, are major contributors to the global disease burden and of increasing concern globally. Haemosporidian parasites are ubiquitous in nature, hugely diverse, and associated with morbidity and mortality across taxa, including humans, livestock and wildlife. Many research groups globally focus on these parasites as model systems for addressing a broad range of ecological and evolutionary questions with economic and health implications. This Action will bring together individuals and research groups to focus on coordinating research objectives to which multiple groups can contribute existing datasets, meaning that questions can be addressed at a global, rather than a local or regional, scale. Ornithologists, mammologists and herpetologists have a long history of investigating haemosporidian parasites in natural populations; these studies have provided insights into host-parasite associations, parasite geographic distributions, host-switching and the context-dependence of host-parasite relationships, alongside pathogenic impacts and conservation implications of haemosporidian infections. Increasingly, research groups are investigating the vectors of these parasites, and utilising novel genetic techniques to understand parasite gene expression, among many other examples. Coordinating and sharing research efforts between groups offers huge potential for large-scale collaborative research initiatives. This Action will promote the development of a common research agenda by providing opportunities for training, collaboration and knowledge exchange, targeting diverse researchers across disciplines to foster an interdisciplinary approach, whilst also recruiting and supporting a diversity of new researchers. The Action will target stakeholders, policymakers and the general public to endorse knowledge transfer and maximise the reach of the network.

Medicinal plants for animal health care: Translating tradition into modern veterinary medicine

CHAIR: Dr Theresa Schlittenlacher (CH)
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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The use of medicinal plants for the treatment of diseased animals has been historically an indispensable part of domestication. Worldwide, they are still important to control animal diseases. However, only few registered herbal veterinary medicinal products (HVMP) currently exist on the European market.

Nevertheless, the demand for natural products supporting animal health and welfare is increasing in the post-antibiotic era. This is in line with the goals of national and international action plans on antimicrobial resistance and of the One Health paradigm and address not only farm animals, but also companion animals living in proximity and contact with their owners. Herbal products are instrumental in achieving these goals.

The European Green Deal, with its ambition to significantly increase organic farming, further underlines the need for veterinary herbal medicine, as phytogenic products are first line treatments of animal diseases on organic farms.

Despite these clear demands for the availability of herbal products, current EU legislation (EU-Regulation 2019/6) is incomplete in regulating the market authorization of HVMP. This might inter alia be due to absence of concise, easily accessible, and critical reflected information about herbal remedies and their traditional and current use for animals.

MedPlants4Vet wants to close this gap.

Along with scientific work and networking, the COST Action will involve and train Young Researchers and Innovators extensively, who will enjoy the support of a multidisciplinary group. Regular meetings, supported by an interactive web-based platform, will help transfer historical knowledge into modern medicinal plant-based health care programs for all animal species.

Cooperation, development and cross-border transfer of Industrial Symbiosis among industry and stakeholders

CHAIR: Ms Almudena Muñoz Puche (ES) a.munoz@cetem.es

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

With the industrial sectors being one of the most responsible for carbon dioxide emissions, energy use and waste production, the implementation of Circular Economy strategy is critical to combating climate change by steering away from the linear economy and its sustainable production and consumption and at the same time, balancing three dimensions: society, environment and economy.

On a practical level, Industrial Symbiosis (IS), understood as the process by which wastes, or by-products of an industry or industrial process become the raw materials for another, has been identified as a promising enabling solution for improving environmental sustainability while simultaneously achieving economic benefits.

However, despite its potential, a lack of awareness is still observed in companies and industrial actors. In addition, IS development is still hampered by environmental, economic, technical, regulatory, organisational, social and cultural barriers.

Thus, LIAISE COST Action aims to ensure an inclusive and holistic IS approach by generating relevant synergies among different actors from the q-helix stakeholders model and by setting the ground for increased and robust development of knowledge, apart from promoting future results-oriented R&D.

LIAISE will therefore establish a link between theory and practice, develop a participatory and practice-oriented approach to support cross-sector and cross-cycle collaborations and establish Key Performance Indicators (KPIs) for assessing the implementation of IS business model in industry. To this end, the excellence of this network will be developed and implemented by three cross-cutting thematic interdisciplinary Working Groups (WGs), further aggregated and exploited through a reference framework in a fourth one.

A European consortium to determine how complex, real-world environments influence brain development

CHAIR: Prof. Sam Wass (UK) s.v.wass@uel.ac.uk

FUNDING PERIOD: September 2023-September 2027

SUMMARY

The early years of brain development are critically influential for life-long outcomes. During early childhood, neurodevelopmental conditions emerge and vulnerabilities for longer-term problems are sown. Homes, schools and neighbourhoods shape children's life chances, interacting with individual differences in cognition and behaviour to determine access to resources and quality of life. However, because almost all current research measures behaviour and brain function by taking children away from these natural environments into controlled lab settings, our knowledge of how early life settings shape development is surprisingly limited. We understand very little about the mechanisms through which specific environmental features impact development (e.g. the effects of variation in noise, clutter, social interaction etc); how these vary across European nations; and how they interact with neurodiverse learning styles. This limits us from designing personalised practical interventions to tailor early environments for different individuals. Under this COST Action we shall create the infrastructure and networks to allow for transformative new approaches to quantifying variability in the early life physical and social environments experienced by children across the EU. We will bring together currently siloed areas of expertise across Europe in new methods for studying children in their natural habitats; new perspectives on cultural and neurodiversity; and new ethical and legal frameworks to support large-scale collaborative developmental science. Our network will be a partnership across European nations and with neurodiverse communities to enable our work to be underpinned by co-creation, ensuring we are harnessing state-of-the-art research efforts to generate meaningful and impactful real- world outcomes.

European Network on Livestock Phenomics

CHAIR: Prof. Luca Fontanesi (IT) luca.fontanesi@unibo.it

FUNDING PERIOD: September 2023-September 2027

SUMMARY

As animal breeding relies on the availability of accurate and specific phenotype data to reach its goals, phenotyping is increasingly being recognised as a limiting factor in all applications of livestock genetics and genomics. The acquisition of relevant phenotypes is also fundamental to routine and daily management of livestock populations in order to optimise reproduction strategies, disease control and welfare of the animals.

Consequently, this knowledge gap needs to be filled to facilitate long-term improvement and a sustainable landscape for livestock production. Phenomics is emerging as a major new technical discipline in biology. Phenomics is focused on one major aim: to systematically describe the phenome, referred to as the physical and molecular traits of an organism. This discipline can be defined as the ensemble of methodologies and technologies for the acquisition, analysis and exploitation of high-dimensional phenotypic data on an organism-wide scale. EU-LI-PHE will create a Europe-centred multidisciplinary, interconnected and inclusive community of experts that will enhance scientific collaboration, catalyse developments, and transfer livestock phenomics concepts and applications to improve the sustainability and competitiveness of the European livestock production sector. The Action will provide i) an overview of phenotyping technologies and infrastructures for applications in livestock phenomics, ii) approaches and methods for genome to phenome integration in livestock species, iii) computational resources and data analysis methods needed for this big data discipline, iv) a regulatory framework and a societal vision on livestock phenomics and v) a training environment for the benefit of the next generation of researchers in this field.

Fundamental challenges in theoretical physics

CHAIR: Prof. Alessandro Sfondrini (IT)
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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Physicists are able to model the world with remarkable accuracy: from the largest cosmological structures to human-scale condensed-matter systems, all the way down to subatomic particles. However, in many cases the mathematical description underlying such systems is so involved that it is only possible to make predictions in an approximation where the interactions are weak. That is, one starts from a free theory and then switches interactions on, order by order in a small parameter. Not only does this strategy fail when applied to strongly-interacting systems, but it also prevents us from answering fundamental questions in theoretical physics.

This Action aims at developing a comprehensive approach for studying strongly-interacting systems in classical and quantum physics by exploiting symmetries, dualities, and the internal consistency of the underlying theories. This calls for the cooperation of researchers from different fields, across Europe and beyond. The Action will bring together theoretical and mathematical physicists with expertise in quantum field theory, string theory, gravity, geometry and information theory, establishing the first network of this kind centred around Europe. Such a critical mass will also boost the visibility and impact of European research in theoretical physics.

In parallel, this Action will strive to bring cutting-edge research in theoretical physics to the general public and to high-school students in particular. Working with teachers and local public bodies, it will combat long-standing prejudices on physics and research that turn away bright young students, and that in the long run may fuel indifference if not distrust towards science.

Maternal Perinatal Stress and Adverse Outcomes in the Offspring: Maximising infants´development

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FUNDING PERIOD: November 2023-November 2027

SUMMARY

High levels of maternal perinatal stress are associated with negative effects in the offspring. The adverse impact maternal stress can have in the infants´s health is 1) in the short term (prematurity, low infant birthweight); 2) the long-term (neuroinflamation, autism); 3) the very long-term (transgenerational effects). Previous studies have reported maternal stress can have transgenerational consequences. During pregnancy, high levels of maternal stress can cross the placenta and reach the fetus. Mediators responsible for the impact of maternal stress in the developing fetus include cytokines, tryptophan, cortisol, cathecolamines, reactive oxygen species, oxidative stress and microbiota. These mediators, along with epigenetic mechanisms, are involved on the adverse consequences high levels of maternal stress can have in the offspring.

In order to improve fetal development and boost infant´s health throughout their lifespan, the TREASURE project aims to consolidate a multidisciplinary and international network of scientists, clinicians, students, stakeholders, Non-Governmental Organisations

(NGOs) and Enterprises to achieve impact through a three-fold main objective: 1) discovering, reviewing and disseminating scientific evidence on minimize, reduce and prevent the impact of maternal perinatal stress on fetal development, and to improve psychological, medical and neural development in the offspring during their life-span; 2) bridging knowledge, evidence and experience between scientific disciplines, and bringing international research groups together to increase knowledge exchange between countries. 3) forming international coalitions to efficiently translate scientific knowledge into clinical guidelines and best practices across Europe to improve the health of children, and reducing economic cost appearing from high levels of maternal perinatal stress.

A Multilingual Repository of Phraseme Constructions in Central and Eastern European Languages

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FUNDING PERIOD: November 2023-November 2027

SUMMARY

To communicate, language users must not only respect the grammatical rules of a given language; they must also have knowledge about which words typically belong together. This means that they must know how to combine words and grammatical forms to create specific meanings in specific contexts. When learning a new language, the focus is usually on the teaching of grammatical rules and vocabulary. Verbal routines and other kinds of patterned speech, such as idioms or proverbs, have also become a natural part of modern foreign language teaching. The PhraConRep Action targets a class of idiomatic word combinations that have been much less of a focus not only in teaching, but also in research. The patterns in question will be referred to as Phraseme Constructions (PhraCons) and are defined as patterns of idiomatic word combinations consisting of fixed lexical elements ("anchors") and empty slots for fillers. Both lexical anchors and lexical fillers must meet certain criteria specific to the given PhraCon.

PhraConRep coordinates contrastive empirical research on PhraCons and establishes a platform for conducting joint research on the classification, description, storage, translation and teaching of PhraCons of Middle and Eastern European languages. Its main objective is to provide a multilingual repository of PhraCons. On the basis of two pivot languages, German and Russian, equivalents of PhraCons are established in at least nine Slavic languages and Hungarian. The repository will be a unique tool for language learners, teachers, and other stakeholders, such as professional translators, involved in the study of these languages.

The Great Leap. Multidisciplinary approaches to health inequalities, 1800-2022

CHAIR: Tim Riswick (NL) tim.riswick@ru.nl

FUNDING PERIOD: September 2023-September 2027

SUMMARY

To this day and age, deep-routed, structural inequalities in health have been one of the most consistent and pressing challenges society has faced. Recent events, such as the COVID19 pandemic highlight the urgent need for new research, insights and action to tackle this challenge for future generations. Embracing the COST Mission, the Great Leap takes a unique, multidisciplinary approach from a historical perspective to gain a greater understanding of the roots and drivers of health inequalities across regions and countries in Europe and beyond. To achieve this mission, the Great Leap creates an international, multidisciplinary network that will bundle expertise, techniques, insights and data to create
(1) the first international comparable dataset of individual-level historical cause of death data, (2) innovative analytical tools to analyse it, and (3) insights into how this information can be used in current public health policy and practice.

The network of proposers includes a wide range of academic expertise in history, social sciences, life sciences and epidemiology and involves university-, research-, government- and (international) health institutes and organizations, including statistical offices and national archives. The network has deliberately chosen for a balanced gender (52.5% male, 45.5% female, 2% non-binary), ITC (52%) and YRI (51%) representation, and aims to maintain this while expanding its network internationally. By fostering the strengths of this unique, multidisciplinary and diverse network, the Great Leap aims to generate ground-breaking insights into the historical roots and drivers of health inequalities across regions and countries in Europe and beyond.

A European flyway research network for the effective conservation of migrant landbirds

CHAIR: Dr Ivan Maggini (AT) ivan.maggini@vetmeduni.ac.at

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

One third of European breeding bird species are migrant birds that occur across the continent and winter in Africa, and most of these species are landbirds. Many species are in serious decline from multiple causes in multiple areas of the flyway.

A COST Action scientific network is needed to understand these migrant landbird population dynamics

because research must take place over the scale of the birds' flyway. We will therefore create a scientific network at the appropriately large scale through flyway level cooperation and coordination of existing local research throughout Europe, and training and sharing of expertise to peripheral countries.

The network will also facilitate new research to determine the time and place of population limitations in the annual cycle of each migrant landbird species. The research is interdisciplinary, including ecology, remote sensing, geographical models and development of statistical techniques to allow effective prediction of how climate and habitat change affects migrant populations. Effective management actions to address migrant bird declines can then be identified and implemented through species action plans, operating efficiently across Europe because they arise from a network already cooperating at that scale. The scientific breakthrough will be to carry out fundamental migrant landbird research at the appropriate scale: examples of the effectiveness of this approach are just emerging and we aim to make this standard across Europe and peripheral countries. This will lead to improvements in our ability to effectively conserve migrant landbird populations that contribute ecosystem services such as biodiversity and quality of life.

Radionuclide theragnostics for personalised medicine

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Image guided treatments with radiotherapeutics have so far been restricted to qualitative evaluation of PET imaging to assess the suitability of patients for a course of treatment. A 'next generation' approach to theragnostics will enable personalised dosimetry-based treatment planning based on the image data acquired ('molecular radiotherapy'). This will entail multimodality imaging, including quantitative PET/CT and SPECT/CT along with MRI for pre-therapy treatment planning and for staging and monitoring response,the standardisation of data acquisition and processing to facilitate multi-centre data collation, and bio-kinetic modelling to extract the maximum information from data and to inform further treatments.

Realisation of the potential offered by a theragnostic approach to treatment requires multi-centre and multi-national collaboration, as a full range of expertise is seldom available in any one centre.

The limited number of patients treated, in comparison with conventional chemotherapy and external beam radiotherapy, also warrants support for the development of multi-disciplinary networks that would promote fast-tracking novel theragnostic procedures into clinical practice.

This COST action will promote the full potential of a theragnostic approach to the treatment of cancer with radiotherapeutics by:

- fostering collaborative research and training between experts and clinical centres to facilitate knowledge transfer.
- supporting the optimisation and standardisation of data acquisition to allow data pooling.
- bridging gaps between stakeholders and supporting communication between cross- speciality experts

promoting multi-disciplinary theragnostic approaches to the development of personalised treatments.

Haemoglobinopathies in European Liaison of Medicine and Science

CHAIR: Dr Petros Kountouris (CY) petrosk@cing.ac.cy

FUNDING PERIOD: September 2023-September 2027

SUMMARY

Haemoglobinopathies, including sickle cell disease and thalassaemia syndromes, are the commonest monogenic diseases, with millions of patients and carriers worldwide. Their global spread has increased due to growing population movements, posing a major healthcare and research challenge. In many EU countries, figures on the prevalence of haemoglobinopathies are largely underestimated owing to the lack of national registries, poor patient access to diagnosis and treatment and the absence of EU-wide synergies.

To fill this gap, this Action will build a network of excellence for integrating, harmonising, and spreading the existing knowledge and for developing innovative services and tools, thus improving knowledge accessibility and healthcare equally across the EU. HELIOS comprises five working groups that will coordinate existing and emerging haemoglobinopathy-related activities in the EU, ranging from clinical and molecular research to data analysis and bioinformatics, aiming to advance health care systems, contribute to informed policymaking and improve survival and quality of life for existing and future patients. To achieve this, the Action has brought together a diverse group of professionals from different disciplines (e.g., clinical research, laboratory genetics and molecular diagnosis, computational biology, bioethics, data management) and sectors (e.g., universities, research centres, healthcare centres, biobanks, private sector). The Action will expand among COST countries, International Partner Countries and Near Neighbour Countries, while respecting gender balance and promoting the active participation of young researchers and innovators.

A European Network to Leverage the Multi-Age Workforce

CHAIR: Dr Justin Marcus (TR) jmarcus@ku.edu.tr

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Europe faces one of the greatest challenges of the 21st century – an aging, age-diverse workforce. In response, 15 EU COST Action networks have been formed, with 3 networks focused on work and aging. Yet, all past Actions have focused on health sciences and sociology – no Action networks have tackled the essential psychological and managerial aspect of work and aging. LeverAge will thus bring together the largest network worldwide of work and aging scientists and practitioners focused on Work, Organizational, and Personnel psychology and Human Resource Management (WOP/HRM), totaling 24 COST Member countries and 8 International Partner countries. In concert with many prominent work and aging scientists in Europe and beyond, the Action will expand science and practice on work and organizational practices for an age-diverse workforce, successful aging at work for workers of different demographics, knowledge transfer between generations, the integration of age-diverse workers at work, aging and technology at work, and late-careers and retirement.

The LeverAge COST Action will build a pan-European and global network of scientists and practitioners focused on WOP/HRM that will advance, share, and promote knowledge and implementation of evidence-based practices to fully leverage the multi-age workforce and enhance the well-being, productivity and prosperity of individuals, organizations, and societies facing profound demographic and technological change.

The Action will establish five Working Groups focusing on key topics:

- Work and organizational practices for an age-diverse workforce
- Successful aging at work
- Integration of age-diverse workers and knowledge transfer
- Aging and technology at work
- Career development in later life and retirement

Rising nationalisms, shifting geopolitics and the future of European higher education/research openness

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

In the last decade, an upsurge of new nationalisms and geopolitical shifts have amplified Eurosceptic opposition and challenged the values of integration at the root of the European integration project. These transformations in the political world in which universities operate exert a growing pressure on the openness of higher education and research and are affecting academic freedom, open science, institutional autonomy, and international engagement, including mobility opportunities. The University finds itself entangled in contrasting visions of Europe: between one of deeper political integration and openness and visions where European nation-states (re) gain power as the locust of political sovereignty or where protectionism, regionalism, and security politics challenge open exchange with communities outside the EU.

The action brings together an inter-disciplinary group of researchers to explore the shifting dynamics between the University, the nation-state and the European integration project.

Through knowledge-exchange and collaboration, the network will converge diverse pan- European and interdisciplinary perspectives on the neonationalism-higher education relationship and accompanying geopolitical pressures. The network will strengthen and showcase European scholarship, and liaise with stakeholders in the domain of higher education and research to generate ideas for addressing and alleviating the growing threats to the University's openness and global cooperation capabilities. In doing so, the network will develop sustainable and transferable analytical and conceptual frameworks for future studies and collaborations, including mentorship programs for early career scholars.

Rethinking the Blue Economy: Socio-Ecological Impacts and Opportunities

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The COST Action "Rethinking the Blue Economy: Socio-ecological impacts and opportunities" (RethinkBlue) centres around the Blue Economy and related policies affecting European societies. After the term was introduced at the UN Rio+20 conference, the paradigm was adopted by various actors across Europe and beyond. In the EU, the Blue Economy paradigm involves regional and national political-economic priorities, new legislative and governance frameworks, and EU and national financial support for sectors of the marine economy. However, the impact of these policies on coastal populations are not yet well-understood. Accelerating globalisation, technological developments and the impact of climate change pose additional challenges.

The purpose of this Action is to rethink the Blue Economy, in two ways. First, by assessing its impact on coastal societies, and second, by exploring opportunities deriving from innovations and potential synergies between established and emergent marine activities. The guiding research questions are:

What are the impacts, positive or negative, of Blue Economy developments on human well-being, social equity and the economic and environmental sustainability of coastal societies?

What are potential opportunities for innovations and synergies between sectors?

Scientific interactions focus on five themes: (1) maritime occupations, (2) food security & sustainable blue consumption, (3) port cities & coastal communities, (4) fisheries governance & emergent activities, (5) climate change & natural hazards. Knowledge exchange and capacity building among researchers and stakeholders of the Blue Economy will be facilitated through meetings, research workshops, an online seminar series, training schools, and conferences.

European Materias Acceleration Center for Energy

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Materials have played a decisive role in nearly all rupture technologies in the industrial history of our society. Faced with the current climate, geopolitical and humanitarian crisis, many international and regional entities (political, industrial and scientific alike) recognize the importance of a strong materials innovation ecosystem for driving the clean energy transition. In response, self-driving laboratories (SDL) (a.k.a. MAPs – materials acceleration platforms) are created at institutional, regional and international levels. SDLs integrate combinatorial synthesis, high-throughput characterization, automated analysis and machine learning for fast-track discovery and optimization of advanced materials.

While these platforms are proving their effectiveness in producing advanced materials with targeted functionalities and physical properties, a large margin of improvement still exists. Streamlining materials integration into components and to safe and sustainable products is one example challenge in order to enable rupture technology. Another challenge is that of geographical concentration of MAPs that practically excludes a substantial fraction of research labs and tech-companies in Europe from contributing and benefiting from such platforms. Finally, next generation material science researchers need to develop new skills to be able to integrate such systemic and automated approach into their future R&D framework. To this end, EU-MACE will become an ecosystem for accelerated materials development at the user end, gathering researchers and stakeholders with state-of-the-art digital and material competences combined with the market/social pull. Our inclusive & systemic approach will lay the foundation for a future centre of excellence for advanced functional materials to assist transition toward a united and stronger EU.

EU Circular Economy Network for All: Consumer Protection through reducing, reusing, repairing

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FUNDING PERIOD: November 2023-November 2027

SUMMARY

The common scope of all states is to make a tangible contribution to the achieving of the objectives of sustainable development for 2030 with the contribution of sustainable consumption. Considering the significant regional disparities in EU and abroad, the lack of a strategic policy framework on regional development, there is an increasing need for all to work towards regional and cross-border cooperation development.

The main aim of the ECO4ALL Action is to contribute to the information, reflection and dissemination activities for youth at large, academics, young researchers, staff of the public administration, business environment and for civil society as a whole regarding the circular economy that works for consumers and, thus, promoting the understanding of sustainable consumption, the conservation of resources and the prevention of waste, as well as the responsibility of manufacturers in the design and marketing phases, as one of the most important prerequisites towards consumer protection through reducing, reusing, repairing.

Innovative aspects of the project consist of the improvement of the green circular economy as a behaviour, by driving the actions and decisions of governments, companies, workers, citizens and consumers to realise their economic, environmental and social impacts in a responsible manner. In the ECO4ALL 's view, the EU institutions focus on the environmental and productive aspects of the circular economy, with barely a mention of the social and consumer-related aspects. Under a comprehensive approach, the proactive role of consumers will overcome mere asymmetrical participation, and must empower them to participate in the full circularity of the process.

Precision medicine in biliary tract cancer

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Biliary tract cancers (BTC) include a heterogeneous group of aggressive tumours with an increasing incidence in Europe. Limited knowledge of risk factors and the lack of biomarkers for diagnosis are responsible for frequent late detection. These tumours are characterised by high refractoriness to conventional chemotherapy, and an unmet need for development of novel therapeutic strategies. Targeted therapies have proven to be a good option for only subgroups of patients, but their access is unevenly distributed across Europe, requiring urgent implementation plans for patients' benefit.

Precision-BTC-Network aims to create a unique cooperative and interdisciplinary network of European multi-stakeholders, including basic researchers, clinical investigators, SMEs, European Commission and EU agencies, international scientific organizations, patient representatives, and industrial partners, to address the diversified, but interrelated challenges, in the implementation of precision medicine in the management of BTC.

The Action will be organized in four working groups involved in the development of a personalized management of patients with BTC: Identification of epidemiological heterogeneity in Europe to apply precision prevention, Personalised early detection of BTC, Personalisation of treatment for patients with BTC, Patient-centric support management, and three horizontal WGs will provide cross-sectional activities relevant to WG1-4 goals: Artificial intelligence, Drug development using preclinical models, and Governance.

The expected impact includes speeding up the development of diagnostic and prognostic biomarkers for BTC patients and bringing beneficial therapies and optimal management of these patients across Europe. In addition, the training of young researchers and innovators in precision medicine in BTC will ensure further progress in the future.

European Network On Lexical Innovation

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Neology is the study of lexical innovation in natural languages, in multiple contexts and over time. Lexical innovation is a massive, permanent and universal phenomenon. From a strictly linguistic point of view, the study of neology "contributes to a better understanding of the lexical system of a given language and its evolution" (Sablayrolles 2019: 7), while from an extralinguistic point of view, "the inventory of neologisms also gives much information about language communities in their material lives and social representations" (ibid.). The key challenges addressed by the network may be summarised thus: 1) Define the core terminology of neology conceived as a discipline through the creation of a born- digital specialised multilingual glossary (none exist currently) in order to facilitate research on an international scale; 2) Adapt digital methodologies and tools to identify and account for lexical innovation; thanks to the involvement of institutions, experts and the general public (crowdsourcing), increase the awareness of lexical creations and their societal implications, foster creativity in mother tongues, clarity in institutional communication and in science; 3) Carry out comparative studies on lexical innovation in European languages, with a particular focus on borrowings and their equivalents; 4) Provide specific training in neology for translators, editors, journalists, technical writers and teachers through a specific protocol that could be replicated for any European language. Conferences, training schools and short-term scientific missions are also planned in order to achieve the aforementioned goals.

COllaboratively DEveloped culturallY Appropriate and inclusive Assessment tool for Palliative Care EDUcation

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FUNDING PERIOD: September 2023-September 2027

SUMMARY

All health systems across the WHO European Region should prepare to respond to the age-related increase in deaths from chronic diseases, by focusing on integration and boosting of palliative care education. The CODE-YAA@PC-EDU COST Action will set quality indicators to establish a gold standard for high-quality education and training in palliative care. CODE-YAA@PC-EDU aims to measure, explore, and promote access to palliative care education and training in the WHO Euro-region, focusing mainly on primary health care, which is considered the most sustainable and cost-effective model for palliative care delivery. CODE-YAA@PC-EDU will develop and provide a new culturally and ethically appropriate inclusive evidence-based self-assessment tool, CODE-YAA, to inform leadership priorities and evidence-based decision-making related to palliative care education and training. CODE-YAA@PC-EDU is composed of three Pan-European; interdisciplinary; geographical, age and gender balanced; open and inclusive; and excellence-driven working groups: FIRE, TORCH, and THUNDER. CODE-YAA@PC-EDU will provide networking opportunities and activities for researchers and innovators to strengthen Europe's capacity to the scientific, technological, and societal challenge of ensuring access to palliative care education and training. CODE-YAA@PC-EDU will capitalise on other EU-funded projects on ethics, research ethics, and palliative care. The CODE-YAA indicators will have a long-lasting impact in Europe and beyond. CODE- YAA@PC-EDU will coordinate joint efforts to seek ways to improve palliative care education and accelerate knowledge transfer into ethically sound practices that can be shared across Europe to reduce the societal and economic burden and harmful experiences caused by people experiencing unnecessary health-related suffering.

Establishing Networks to Implement the Principles on Effective Interviewing for Investigations

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Interviews conducted across the world by police and other law enforcement agencies with suspects, victims and witnesses are crucially important in determining criminal justice outcomes. The Action Team knows from their combined expertise that there are two distinct approaches worldwide.

Firstly, several Member countries have developed (or are developing) an ethical approach termed 'investigative interviewing', that aims to obtain detailed and reliable information, while respecting human rights. This approach is consistent with the 2021 United Nations Declaration of the 'Principles of Effective Interviewing', known as the 'Mendez Principles' after the UN Special Rapporteur; Professor Juan Mendez. Over a three-year period, he led a committee of experts including those in law, forensic psychology and criminology alongside representation from civil society, culminating in the formal declaration of the principles that are grounded in science, law and ethics (see, https://interviewingprinciples.com/).

Secondly, however, it is well chronicled both from the literature and actual cases that law enforcement agencies in most countries remain unaware of the investigative interviewing approach, undertaking unethical practices, characterised by guilt presumption and confession-orientation that often rely on psychological manipulation, intimidation or physical torture, and can lead to miscarriages of justice and failed investigations.

This Action involves a timely and much-needed strategy of convening regional and in- country networks of researchers, practitioners and policy makers working with each other and with the Action Team to build on our early work to enable wider implementation of the 'Mendez Principles', ending cruel and inhumane practices that have adversely affected so many lives through unethical interrogations.

InsectAI - Using Image-based AI for Insect Monitoring & Conservation

CHAIR: Dr Tom August (UK) tomaug@ceh.ac.uk

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The InsectAI COST action will support insect monitoring and conservation at the national and continental scale in order to understand and counteract widespread insect declines.

The Action will bring together a critical mass of researchers and stakeholders in image- based insect AI technologies to direct and drive the research agenda, build research capacity across Europe, and support innovation and application.

There is mounting evidence that populations of insects around the world are in sharp decline. Understanding trends in species and their drivers are key to knowing the size of the challenge, its causes, and how to address it. To identify solutions that lead to sustainable biodiversity alongside economic prosperity, insect monitoring should be efficient and provide standardised and frequently updated status indicators to guide conservation actions.

The EU Biodiversity Strategy 2030 identifies the critical challenge of delivering standardised information about the state of nature, and image-based insect AI can contribute to this. Specifically, the EU Nature Restoration Law will likely set binding targets for the high resolution data that cameras can provide. Thus, outputs of the Action will contribute directly to EU policies implementation, where biodiversity monitoring is considered a key component.

The InsectAI COST Action will organise workshops, conferences, short-term scientific missions, hackathons, design-sprints and much more, across four Working Groups. These groups will address how image-based insect AI technologies can best address Societal Needs, support innovation in Image Collection hardware, create standardised approaches for Image Processing, and develop novel Data Analysis and Integration methods for turning data into actionable insights.

Comprehensive Multiboson Experiment-Theory Action

CHAIR: Prof. Ilaria Brivio (CH) ilaria.brivio@unibo.it

FUNDING PERIOD: September 2023-September 2027

SUMMARY

The first decade of operations of the Large Hadron Collider (LHC) has consolidated the success of the Standard Model (SM) of particle physics. In particular, the discovery of the Higgs boson confirmed the "Higgs mechanism" as an appropriate description of electroweak symmetry breaking (EWSB). Yet, the dynamics underlying the EWSB, and therefore the nature of the Higgs boson itself, is still unknown. This represents one of the most pressing open questions in contemporary particle physics.

Shedding light onto the nature of the EWSB requires studying the dynamics of the scalar sector of the SM as a whole, examining the Higgs, W and Z bosons in a coherent way.

Concretely, it is crucial to measure several multi-boson production processes and to combine them into comprehensive global analyses. The identification of inconsistencies with the SM in such measurements would represent a major achievement in the field, that would be decisive in defining its research targets for the next decades.

These measurements are very challenging, because of the overwhelming backgrounds, the required precision of theory predictions and the large number of processes of interest. Only a coordinated effort will allow us to create a consistent high-precision picture of EWSB dynamics.

COMETA will create a tightly interconnected scientific community that will bring substantial improvements to this quest, by fostering communication between diverse research groups and enabling the development of dedicated advanced technology. The network will involve world-leading experts from theory and experimental HEP groups, as well as artificial intelligence practitioners within and outside academia.

Supramolecular LUminescent Chemosensors for Environmental Security

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The main goal of LUCES is the creation of a multidisciplinary network, comprised of researchers with complementary expertise from academia, technological centers and industry, working towards the development of luminescent sensors to be used to help resolve environmental security problems. The luminescent signaling unit will confer a high sensitivity to the sensor and be activated following the molecular recognition event. The Action will gather the leading research groups in the field of supramolecular chemistry, chemical sensors, (nano)materials, electronics, theoretical calculations as well as experts in different analytical techniques, researchers from industry and interested stakeholders, in order to be able to fulfil all the requirements to arrive to bridge the gap between fundamental research and the market. This multidisciplinary group will be strongly committed to promote a competitive European network in which the participation of Young Career Innovators and Inclusiveness Target Country will be highly valued. In this way, LUCES is expected to become an international reference network that can be contacted by any researcher and/or company looking for specific solutions in this topic. Transfer of knowledge will be also carried out through conferences, annual meetings, workshops, training schools and STSMs. Mobility of young researchers between different centers (academic and industry) will reinforce the existing contacts and ease the success of the Action. Dissemination of results will raise awareness about what science, in particular supramolecular luminescent chemosensors, can do for society, promoting the active collaboration between academic and non-academic researchers.

Open Network on DEM Simulations

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Particle-based simulations model diverse materials including sand, food grains, pharmaceutical products, ceramic powders and bulk materials, amongst others. Discrete Element Method (DEM) simulations are used across multiple disciplines; as a result, the techniques have developed in different ways across these disciplines, and many DEM software packages exist. Even for experienced researchers the choice of a DEM code is challenging and involves a steep learning curve. However, open-source programs are free, well adapted to research, and promote knowledge sharing, reproducibility, and versatility. They also prevent the "black box" problems encountered with proprietary/commercial platforms.

This Action aims to unify knowledge and people across wide/diverse DEM communities.

The Action will assess and extend what can be achieved with DEM by disseminating new developments, promoting best practice, providing simulation examples, validation experiments, common tools for data analysis, as well as training of early career investigators and involving other interested parties.

The COST Action has five themes: (i) tackling real (large) industrial and engineering problems; (ii) using physics to account for complex phenomena more realistically; (iii) big data and visualization tools for better and quicker DEM analysis of results (iv) normalisation and best practice (v) enhancing commercial utilisation of DEM codes. Each of these themes is aligned to a different Working Group, each addresses major current challenges related to DEM simulation. A sixth Working Group specifically dedicated to the dissemination and publication of activities and will ensure that this network provides substantive benefits to the various DEM communities whilst also engaging with various interested stakeholders.

The birth of solar systems

CHAIR: Dr Catherine Walsh (UK) c.walsh1@leeds.ac.uk

FUNDING PERIOD: September 2023-September 2027

SUMMARY

Solar systems emerge from the dust, gas, and ice present in discs encircling newly-born stars. State-of-the- art images from current telescopes have revealed complex substructure (rings and gaps) in dust and gas that may be caused by forming planets.

However, these observations have raised many questions regarding when and how planets form; for example, we see rings in discs too young to birth planets, and we measure disc masses too low to form a Solar System analogue. Further, the demographics provided by observations of extra-solar planetary systems have revealed huge diversity and hint that our Solar System may be unique. It is clear that our picture of the birth of Solar Systems remains incomplete despite these great advances in observations.

This Action will create a multi-disciplinary network covering three cornerstones: experiments, models, and observations. Experimental data is needed to accurately prescribe physics in models of disc evolution and planet formation, and to correctly interpret observations of dust and gas emission. Models are a "virtual laboratory" within which the impact of physics can be explored, and from which observational diagnostics can be created. Finally, observations provide us with the benchmarks needed to confirm or refute our picture of Solar System birth.

To build a holistic picture of how Solar Systems form can only be achieved with an interdisciplinary and pan- European network. This Action will provide the structure and funding needed to develop the research framework, provide training to the next generation, and to disseminate the findings to key stakeholders.

Sustainable Network for agrofood loss and waste prevention, management, quantification and valorisation

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FUNDING PERIOD: September 2023-September 2027

SUMMARY

Food loss and waste (FLW) is a global challenge recognised by international governments and organisations. Reducing FLW is key to sustainably ensure nutritional food security for an increasing world population. It is a target of the Sustainable Development Goals of the United Nations, and the Farm to Fork Strategy of the European Green Deal. The FoodWaStop COST project addresses these challenges and aims to: (i) build an interdisciplinary and multi-actor European Network that will also connect with non-EU Mediterranean countries, to promote knowledge on FLW beyond the state of the art; (ii) determine incidence of FLW in the critical points of the fruit and vegetable value chain; (iii) foster technological innovations and sustainable management strategies to reduce and prevent FLW; and (iv) valorise agrofood waste to promote a circular bio-economy. The experience of the Coordinators and Participants gained from other related projects (e.g., PRIMA, H2020), the background from diverse EU and extra-EU countries, and the involvement of stakeholders and industry partners will contribute to increase awareness of this problem, to determine its incidence, to seek strategies for its management through exploitation of the potential of innovative technologies, and to define good practices to prevent FLW. The FoodWaStop Network will provide benefits to various stakeholders and end-users, including all actors in the agrofood value chain, from farmers (Farm) to consumers (Fork). Moreover, FoodWaStop will create a knowledge platform that will promote innovation, deliver guidelines, and favour dialogue with policymakers, to focus their attention on the social and economic implications of FLW.

Data Matters: Sociotechnical Challenges of European Migration and Border Control

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FUNDING PERIOD: September 2023-September 2027

SUMMARY

Issues pertaining to the control of migration and borders are of paramount importance for contemporary societies. The way the relevant technology is designed and used is central to these issues. The configuration of migration and border control increasingly relies on artificial intelligence and associated digital technologies, which are based on algorithms that feed on big data. DATAMIG is focused on the need for a caring approach to big data and for the socio-technical challenges it entails. More specifically, it aims at supporting interdisciplinary research into the ways that the technological materialities inherent to the datafication of migration and border control may, on account of their black-boxed design, reproduce patterns of inclusion and exclusion that have already severely affected society. DATAMIG will foster the formation of an inclusive, self-expanding network that integrates the various disciplines contributing to the field of Science and Technology Studies (STS, with sociology of science and technology at its core) into the study of migration and borders. This will allow the latter to benefit from a unique interdisciplinary collaboration with other pivotal scientific/technical fields, including but not limited to critical Data Studies. DATAMIG will usher in building an interdisciplinary vocabulary to make data a public matter of concern and care, through research that benefits from bringing together previously disconnected arenas of contestation and public interventions concerning data matters in European migration and border control.

Pan-European Network of Green Deal Agriculture and Forestry Earth Observation Science

CHAIR: Dr Shawn Kefauver (ES) sckefauver@ub.edu

FUNDING PERIOD: November 2023-November 2027

CA22136

SUMMARY

The sustainability of Europe's green resources are threatened by climate change associated environmental changes. Agricultural systems and forests are among the ecosystems mostly interlinked with human health and wellbeing due to the socio-economic services they provide. Whether heat, drought, extreme weather, or biotic stressors, conventional agriculture and forestry today is unprepared for future climate scenarios, rising populations, changing consumption habits, and traditional management practices need re-thinking. The objectives set by PANGEOS are developed in the wake of the European Green Deal strategic goals. For agriculture, these include ensuring food security in the face of climate change, strengthening the EU food system's resilience and reducing the environmental and climate footprint of the EU agricultural sector towards a competitive and sustainable use and management of resources. For forestry, these span the protection, restoration and enlargement of the EU's forests to combat climate change, reversing biodiversity loss and ensuring resilient and multifunctional forest ecosystems. To support these goals, PANGEOS aims to leverage state-of-the-art remote sensing (RS) technologies to advance field phenotyping workflows, precision agriculture/forestry practices and larger-scale operational assessments for a more sustainable management of Europe's natural resources. We propose to bridge the gap between state-of-the-art technologies and applied sciences, to directly serve and inform academics, Young Researchers and Innovators, Inclusiveness Target Countries and Near Neighbor Countries, end-users (e.g., farmers, foresters), and stakeholders in industry and policy- makers by bringing together RS experts and applications in (1) Field Phenotyping, (2) Precision and Regenerative Agriculture, (3) Sustainable Land Management of Complex European landscapes, and (4) Uncertainty Analysis and Standardization.

Randomised Optimisation Algorithms Research Network

CHAIR: Dr Carlos Fonseca (PT) cmfonsec@dei.uc.pt

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The multiple requirements placed on modern real-world processes and systems are ever more demanding. Meeting such requirements can only be achieved through systematic methods capable of identifying the best course(s) of action among the possible alternatives, which are generally known as optimisation algorithms. Optimisation algorithms find application in virtually all areas of knowledge and human activity, but require suitable models of the problems of interest in order to operate. Producing such models is often a challenging task which involves understanding both the problem at hand and the type of optimisation algorithm to be used, and may entail significant effort.

Compared to their deterministic counterparts, randomised optimisation algorithms tend to be simpler to design and implement while offering improved performance, particularly on large problems whose internal structure is not sufficiently well known or even available.

However, randomised optimisation algorithms are still far from reaching the level of widespread and systematic adoption enjoyed by more traditional optimisation solvers in the real world.

This COST Action aims at making randomised optimisation algorithms widely competitive in practice by identifying and reducing obstacles to their adoption at the scientific, technical, economic, and human levels. It focuses on meeting the needs of practitioners, from whose activities the economical value of optimisation solvers stems. These needs are taken as the driving force for new theoretical, methodological, and technical advances leading to the sustainable development of widely available software tools, training materials and programmes, and ultimately to more extensive acceptance and deployment of these methods.

Recovery of Mining District Network

CHAIR: Dr Jinřich Šancer (CZ) jindrich.sancer@vsb.cz

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The extraction of minerals and metals from the earth crust is as old as human mankind. The management of mine closure and post-closure is getting more and more attention because in Europe as well as worldwide many regions are affected by environmental residues such as tailings, waste dumps, subsidences, contaminated water which is the result of unsatisfactory environmental performance of the mining industry in the past.

All European countreis are facing these problems and many of these countries are lacking funds and capacity in managing these old mine sites. This network of proposers with 74 scientists and practionizers from more than 60 organisations from 28 EU countries focus on legislation, governance and management of these legacies, financing as well as rehabilitation and monitoring techniques to improve implementation to minimize post- closure mining legacies. It will establish an European mining legacy database, compare present legal framework, governance structures and management approaches, provide input to mine authorities, regulators and financial institutions on a social balanced and environmental friendly management of mine legacies, harmonise best practices, standards and lessons learnt for a comprehensive and sustainable management of raw materials' extraction legacies and disseminate the results to the public through an open access visualization platform. The network pools experts from currently separated fields (e.g. geologists, economists, engineers, environmental and social scientists, metallurgists, legal representatives, etc.) to consolidate knowledge and foster mutual exchange of knowledge between researchers.

Justice to youth language needs: human rights undermined by an invisible disadvantage

CHAIR: Prof. Maria J Arche (UK) m.j.arche@greenwich.ac.uk

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

This Action addresses the lack of consistent policies to establish the language abilities that children and adolescents need to possess in order to participate in justice proceedings effectively. The journey through criminal justice is based on highly verbal processes that require a level of verbal ability that is unlikely among young offenders for several reasons: firstly, research in the English-speaking countries (severely limited in other European countries) shows that the prevalence of language impairment is up to six times higher in the population of youth offenders; if undiagnosed and untreated, it increases the risk of re-offending. Furthermore, linguistics research demonstrates that some syntactic abilities are still under development during (pre)puberty, and that the abilities to connect language to context may be underdeveloped even after the age of 18. In addition, comprehension of structurally complex language is low when academic attainment is low, which is the general case for young offenders. However, there are no procedures to establish language ability across populations to date and lack of awareness pervades the justice systems. Even where screening for language difficulties exists, it is not sufficiently nuanced to capture issues with the most common structures found in justice interchanges and no attention is paid to the needs of children from different education backgrounds, with disabilities, who are multilingual, or who are deaf or hearing impaired. To ensure protection of human rights of this vulnerable population, an Action to assess the situation at European transnational level and propose specific measures to identify language needs is urgent.

Improved Knowledge Transfer for Sustainable Insect Breeding

CHAIR: Dr Gertje PETERSEN
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FUNDING PERIOD: September 2023-September 2027

SUMMARY

The global population is expected to increase to 10 billion by 2050, bringing with it an increased demand for food and specifically protein. Insect farming can play a major role in ensuring global food security, reducing the environmental footprint of food production, and increasing sustainability of modern farming systems. However, it is currently relying on insect populations whose genetics are poorly understood and who are not necessarily bred- or even fit-for-purpose. Understanding the genetics of large livestock species has made a big difference to the advancement of farming systems, but little effort and research has been put into developing structured breeding programs that would ensure genetic improvement of insect species. With the increased importance of honey bees as pollinators and the continuous scale-up of other insect farming systems, there is a rising need to coordinate research efforts in the field of insect breeding and genetics. The Insect- IMP Action aims to connect researchers from various fields of genetics, entomology and veterinary sciences, both with each other and with other stakeholders across the entire farmed insects sector. The Action will focus on knowledge transfer between various insect species, as well as from other animal breeding and genetics sectors to allow for economic and research gains in insect farming and beekeeping. The collaboration within the Action will enable a more sustainable growth in the insect farming sector, progress European research capacity by laying the foundation for long-term collaboration within both research and industry across borders, and support educated decisions on insect breeding regulations.

Integrated DSS for delivery of ecosystem services based on EU forest policies

CHAIR: Mr Jan Kašpar (CZ) kasparj@fld.czu.cz

FUNDING PERIOD: September 2023-September 2027

SUMMARY

Forests are significant part of surrounding landscape and every management decision in forest affects the landscape as well, and vice versa, management decision in surrounding landscape affects the forests. There is thus a need for an integrated DSS framework that addresses all objectives of sustainable forest management in the landscape appropriately by linking all mutual relations between forests and surrounding landscape. Such integrated DSS framework will require the consideration of information and approaches from different rural and landusing activities and sectors. In this context, juxtaposition and integration of the knowledge from DSS (developed for farming, animal husbandry, forestry, ecosystem management, etc.) will be an excellent starting point for advancing toward an integrated system for sustainable assessing the provision of ecosystem service (ES) at landscape scale, including provision of resources for bio-based economic activities, protection and regulation, or cultural services. The main aim of this Action is to establish a research network for facilitating the conceptualisation and development of new methodological approaches in decision support systems including important relations between forest and landscape. The emphasis is on screening, evaluating and proposing existing and future tools to support holistic planning approaches to increase sustainable forest management, considering various ecosystem services and products addressing the associated risks and uncertainties.

Beneficial rOOt-associated microorganisms for SusTainable agriculture

CHAIR: Dr Benoit Lefebvre (FR) benoit.lefebvre@inrae.fr

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Beneficial root-associated microorganisms, including arbuscular mycorrhizal fungi, nodule- inducing nitrogen-fixing rhizobia, and plant growth-promoting bacteria/fungi, are key players for crop productivity in low-input systems. Identification of environmental and genetic determinants controlling their interactions with crops is paramount for the development of a more sustainable agriculture, and this requires multidisciplinary research approaches. However, the research field remains fragmented and beneficial microorganism interactions with plant roots are often overlooked in agricultural management practices or in breeding programs. BOOST aims to bring together, specialists of these different types of beneficial interactions working at different levels of study, together with socio-economic actors to create a network able to: i) sum up and disseminate the current knowledge on agronomic, environmental and economic criteria characterizing the services provided by beneficial root-associated microorganisms, ii) perform meta-analyses with existing datasets, iii) identify gaps in the current knowledge and define future research priorities, iv) propose methodologies and strategies for implementing or improving crop interactions with beneficial root-associated microorganisms in agriculture, v) coordinate research efforts and build consortia able to propose projects in future European/transnational funding calls, vi) propose recommendations on microbial applications to inoculant producers, policy-makers and end-user farmers. Overall, BOOST will strengthen the European research capacity and leadership on beneficial root-associated microorganisms, and facilitate knowledge transfer to socio-economic actors and inclusiveness towards European and Mediterranean countries.

European Materials Informatics Network

CHAIR: Dr Francesco Mercuri (IT) francesco.mercuri@cnr.it

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The development, engineering and improvement of materials is one of the key factors for socio-economic advancements in Europe and worldwide. In this context, recent developments in materials informatics, artificial intelligence (AI) and data-centric technologies are revolutionizing the whole field. Despite significant progress in this direction, however, the efforts of the European research landscape are still not fully coordinated, thus hampering the potential impact of innovations on materials in society, industry and economy.

The EuMINe COST Action aims at promoting an international, interdisciplinary and intersectoral community focused on the application of materials informatics to the development and engineering of advanced materials. Overcoming current fragmentations, EuMINe targets the harmonization of approaches and resources, contributing to the creation of a shared European knowledge on the application of data- centric technologies to materials science and engineering.

Meeting this challenge requires coordination and cooperation across a broad range of interdisciplinary competences. EuMINe brings together a network of scientific excellence, gathering institutions with expertise in physics, chemistry, computer science, materials science, engineering, modelling and simulation, industrial research and knowledge transfer. To maximize the impact of the action, links with a broad range of stakeholders will be established, including public and private institutions, communities involved in modelling, design and characterization of materials, large-scale computing infrastructures and data-centers oriented to materials. The use of COST networking tools will be crucial for fostering collaborations and initiatives within the network, increasing the impact of European research in the field, engaging stakeholders actively and developing and promoting training opportunities.

Sustainable use of salt-affected lands

CHAIR: Dr Katarzyna Negacz (NL) k.e.negacz@vu.nl

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Salinisation, the accumulation of water-soluble salts in the soil, is one of the major causes of soil degradation affecting 833 million hectares of land and 1.5 billion inhabitants worldwide. However, these lands can be used by applying saline agriculture, involving soil, water and salt-tolerant crop management methods. Cultivation of salt-affected lands aids in addressing food and water security in the times of progressing climate change and population growth. As a result, there is an urgent need to create a network of research and practice and foster the sustainable use of salt-affected lands.

This COST Action aims to build a global transdisciplinary network of scientific experts and engaged stakeholders in the field of salinity research in the context of food security, sustainability and the intensifying climate crisis. Our activities will focus on: (i) understanding responses to heterogeneous soil salinity and other combined stresses in the soil-rhizosphere-plant continuum; (ii) building a knowledge-base to improve water and soil management, and crop production on salt-affected lands; (iii) showcasing the total value of salt-affected lands and saline landscapes; (iv) connecting various stakeholders involved in saline agriculture; and (v) developing targeted policy frameworks for the proper salinisation management, bringing saline agriculture as a complementary component in the European food security agenda for coastal and inland salt-affected lands. Mutual knowledge exchange and sharing best practices will contribute to more sustainable use of salt-affected lands and enhance the resilience of the landscape as a whole.

Computational Techniques for Tabletop Games Heritage

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Games have been a research topic across many disciplines that have long been disconnected from one another. In computer science and mathematics, games have been used as testbeds for the development of state-of-the-art methods in economics, engineering, and Artificial Intelligence. Archaeologists, historians, and anthropologists, have examined the motivations behind human play and its social implications on the individual and societal levels. Games have also long been the subject of pedagogical development, and are increasingly becoming recognized as part of the intangible cultural heritage of humanity. Nevertheless, much of the heritage of games around the world has been lost due to colonialism, imperialism, and commercialisation.

The GameTable Action aims to create an international and interdisciplinary network of scholars and stakeholders from all career stages across academia, industry, and heritage institutions to inspire methodologies and applications on how to use game AI to study, reconstruct, and preserve the intangible cultural heritage of games. More holistic methodologies will be achieved by developing more human-like AI techniques, using them to analyse mathematical properties of games, and combining them with game-theoretic models, and guiding them with knowledge of games of the past and a cross-cultural understanding of human gameplay. These collaborations will include conferences, workshops, and other cross-disciplinary interactions that will produce publications and digital tools to advance the theoretical and practical applications of research on games.

From this, we will develop sophisticated methods for the preservation of games as a form of ancient and modern cultural heritage and game-centric educational programs.

Harnessing the potential of underutilized crops to promote sustainable food production

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

With population growing rapidly and within the context of agro-climatic changes, there is an increased demand to sustainably produce nutritious food. In Europe, many nutrient- dense foods are not widely grown and consumed, despite their suitability to European climates and environments, and viability for sustainable production with lower inputs.

Underutilised crops that are stress resilient such as rye and legumes, have the potential to supply key nutrients and improve diets and risk of diet-related diseases. Such crops have a long history of cultivation across the continent and are part of the national historic food identity of different European countries yet are underutilised due to several complex reasons. DIVERSICROP addresses these challenges using an innovative, cross-sectoral and multidisciplinary approach by analysing the deep history of underutilised crops in Europe, understanding the genetic diversity and adaptation to climate change of crop germplasm, analysing current regional trends in the consumption of food products and by involving national and EU policymakers and key stakeholders to revive diverse crop production and maximise the impact of Europe's agricultural sustainability. DIVERSICROP aims to harmonise fragmented data and develop strategies for the sustainable cultivation of target crops, striking a balance between agricultural sustainability and human nutritional value. DIVERSICROP brings together a skilled and interdisciplinary network to identify climate-resilient crop lines, and potential nutritional and health benefits of their consumption to rethink our food systems. DIVERSICROP will strengthen the Farm to Fork and the Biodiversity strategies under the European Green Deal to contribute to achieving the UN Sustainable Development Goals.

European metal-organic framework network: combining research and development to promote technological solutions

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FUNDING PERIOD: November 2023-November 2027

SUMMARY

The constantly growing world population and current European energetic crisis demand innovative scientific and technological solutions. The crystalline hybrid material class of Metal-Organic Frameworks (MOFs) holds potential to help address societal challenges like health, water and sustainable energy due to their unprecedented high degree of porosity, chemical and structural versatility, and functional tunability. However, the translation of groundbreaking basic research into development of potential MOF-based technologies is still hampered by the lack of precise control over their structure, properties and performance from the molecular-level framework to the nano-, meso- and macro-scale dimension material for each application. This COST Action (EU4MOFs) aims at increasing control and customization over the interplay between (re)activity, selectivity, efficiency and processability of MOF materials to ensure optimal functional properties at these three length scales. EU4MOFs will focus on paving the way towards the development of nano-, meso- and macro-scale high-performing MOF materials for three high-need applications: (cancer) nanomedicine, wastewater treatment and energy storage. To achieve this, manufacturing technologies based on bottom-up synthesis and top-down engineering strategies will be consolidated, and high-throughput computational screening and machine learning methods will be integrated to improve structure-property predictions and the resulting materials performance. By uniting interdisciplinary researches from the fields of (bio)chemistry, materials engineering, physics, nanomedicine, pharmacy, and computational science, together with industrial partners, EU4MOFs will contribute to substantially advance the current frontiers of MOF materials from the laboratory bench towards industrial-scale, in order to ultimately generate societal impact.

An international network for Non-linear Extreme Ultraviolet to hard X-ray techniques

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Extreme UltraViolet (EUV) High-Harmonic Generation (HHG) table-top sources and soft to hard X-ray Free Electron lasers (XFELs) have opened a new era in science, providing ultrashort, coherent and tunable pulses that are currently used to perform cutting edge experiments in Atomic and Molecular physics, condensed matter physics, biology and chemistry. Most of the reported studies rely on linear light-matter interactions, which are fundamentally limited in the dynamical information they can provide. Non-linear radiation- matter interactions have proven to be a powerful tool to unravel hitherto inaccessible properties. The advent of the above sources now enable non-linear techniques in the EUV/X-ray range, akin to what occurred with IR-visible-UV non-linear optics, by accessing the properties of materials at the nanoscale level, with femtosecond time resolution, chemical selectivity, high momentum, and polarization control. The NEXT COST Action will capitalize on pioneering promising results, reported over the last decade, to create the first concerted experimental and theoretical effort aimed at implementing EUV/X-ray non- linear spectroscopy at table-top HHG and XFEL sources. Europe has a strategic leadership role, with its large number of research groups managing world-class table-top sources and hosting 4-out-of-7 XFELs available worldwide. We expect this Action to have a strong impact on technology supporting the development of novel materials, nanodevices, quantum computing and chemistry, as well as on the training of young scientists as the next generation of researchers that will fully exploit these novel methodologies and tools. NEXT will also act as a key research and innovation bridge between academe and industrial partners.

Research Network for Interdisciplinary Studies of Transhistorical Deliberative Democracy

CHAIR: Prof. Darko Darovec (SI) darko.darovec@irris.eu

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

This Action's main aim is to systematize, conceptualize and epistemically upgrade theoretical and empirical knowledge of the influence of past practices of deliberation on contemporary decision-making. With this emphasis, the Action is placed at the centre of the topical debates about the potential role of deliberative democracy in stabilizing social and political spheres and coping with contemporary challenges and risks. It will push human abilities to prevent conflicts through deliberation and to decide on development issues through dialogue to the forefront of our research.

The Action will explore relationships between the past, present and future forms of deliberation by taking into account: 1) historical deliberative practices (diachronic aspects); 2) culture, cognition and narratives of legitimacy (synchronic aspects); and 3) goals of deliberative democracy, set as guiding principles aimed to ensure general well-being and the positive development of society (integrative level). In this respect the Action aims to design a research framework to test its original concept and main research method – transhistorical deliberative democracy.

The Action will establish innovative collaborations with various types of stakeholders and create an interdisciplinary, fully open and flexible international platform to discuss existing research approaches to decision-making, initiate new synergies, and devise a set of toolkits and guidelines, which will enable decision-makers and other stakeholders to design and implement policies by considering the impacts of embedded patterns of deliberation on local, national and transnational levels. The Action is designed with a focus on the inclusion of young researchers from ICTs in interdisciplinary and international research environments.

Comparative Research on the Executive Triangle in Europe

CHAIR: Prof. Thurid Hustedt (DE) hustedt@hertie-school.org
FUNDING PERIOD: October 2023 - October 2027

SUMMARY

CoREx creates a unique pan-European network of researchers studying the relationships of executive politicians, top civil servants, and ministerial advisers ('the executive triangle') from an internationally comparative perspective. These three actors and their mutual relationships significantly shape policymaking. Their capacity to solve problems and to make legitimate decisions are at the core of democratic governance. While pressing contemporary policy problems require professional top civil service competence, executive politicians demand political advice from personally trusted individuals to navigate their increasingly polarized and mediatized environments. CoREx addresses this tension between professional competence and political craft by taking a system-perspective on the executive triangle. Through pan-European networking and knowledge sharing across all regions in Europe, it develops a common conceptual and methodological framework revolving around different dimensions of politicization to collect comparative data from across Europe. Thereby, CoREx bridges currently disconnected research on the top civil service and ministerial advisers, as well as disparities in geographical coverage and research capacities. CoREx will generate comparative datasets and analyses on the institutional set-up, career backgrounds, roles and interactions in policymaking, and accountability and transparency of the executive triangle across regions and over time. In an innovative way, CoREx will provide systematic comparative knowledge about trends, causes, and consequences of different configurations of the executive triangle. CoREx contributes to a better understanding of democratic governance in times of increasing political polarization and populist politics. The unprecedented results will be relevant for the scientific community, stakeholders, and the public at large.

Cyber-Physical systems and digital twins for the decarbonisation of energy-intensive industries

CHAIR: Prof. Alessandro Parente (BE)
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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Industrial production is responsible for roughly 30% of global energy use, with Energy Intensive Industries (EIIs) representing the largest share (54% of OECD's total industrial energy consumption). The current energy crisis, originated by Russia's war with Ukraine, Western sanctions against Moscow, and Russia's cut-off of pipeline gas, has made the cost of natural gas soar and ignited a cascade resulting in the increased prices of other energy sources. As a learning for the future, it is crucial to strengthen the EU's capacity to produce energy while reaching net-zero emissions by 2050. The solution lies in producing Renewable Synthetic Fuels (RSFs), including renewable hydrogen, from excess wind and solar power to decarbonise EIIs. Also, at the 26th UN Climate Change Conference of the Parties (COP26), it was unanimous that hydrogen can play a vital role in the way we bring fully decarbonised energy to our lives. However, a complete understanding of the impact of RSFs on EII systems remains unaddressed mainly due to a lack of comprehensive methods and specialised and multidisciplinary knowledge in RSFs' combustion, which can be advanced through approaches bringing together data-driven methods and physics- based modelling for accurate simulation of combustion technologies through enhanced modelling, sensing and digital twins. The main aim of CYPHER is to propel the collaborations between European researchers and industrial stakeholders to foster the use of cyber-physical systems (self-updating digital twins) and ultimately promote a safe and sustainable adoption of RSFs as a critical path for EII decarbonisation.

Supporting emerging care economy, empowering caregivers to provide safe care at home

CHAIR: Prof. José Joaquín Mira (ES) jose.mira@umh.es

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The Care Economy is a groundbreaking field due to population aging and the increase of non-communicable diseases. Ensuring the provision of safety care at home and helping people to stay in their places as much as possible are current challenges. Caregiving at home has increased in the complexity of care and intensity which augmented the risk of making errors impacting on both, recipients' health, and caregivers' wellbeing. In most cases, home care is provided by family members, usually women, which enlarges the gender gap. This Action joints efforts to ensure an error-free care environment at the homes. It introduces an open dialogue and discussion among all stakeholders about the consequences of caregivers' errors based on a cross-national collaboration that integrates citizens, end users, different disciplines, and perspectives. It will be built on existing work and will provide opportunities to re-think national, and international deinstitutionalize policies, assuring the same care safety at home as the one received in residential facilities. To assess available resources to meet the qualification threshold and modify the support net available for the management of risk of caregiving and dispensing medications at home. Citizens Science principles will be adopted to open debates and analyses about educational standards, develop of a guideline and case study based on caregivers' stories, and other materials. Also, to organize and conduct a Training School and Short-Term-Scientific-Mission involving caregivers as ended users and professionals. Health, psychological, social, legal, ethical, and economic issues will be considered and the usability of disruptive technologies as well.

European Curvature and Biology Network

CHAIR: Prof. John Dunlop (AT) john.dunlop@plus.ac.at
FUNDING PERIOD: September 2023-September 2027

SUMMARY

Cells and tissues interact with their physical environment, and can sense via mechanical signalling the presence and geometry of external boundaries. A key descriptor of boundary shape is the surface curvature and it has been indeed shown that surface curvature influences cell and tissue behaviour. The processes of growth and remodelling allow these boundaries to be moved and shaped by cells, thus creating a fundamental feedback between the development of form, biological response and the physics of the surrounding environment. Although these ideas go back to the classic work "On Growth and Form" from D'Arcy Thompson, only now do we have tools to investigate these topics in a quantitative and predictive manner. This COST action will establish an interdisciplinary network of researchers from biology, mathematics, physics and materials science involved in researching the interplay between curvature and biology. The main objective is to bridge the inherent gap between these disciplines by helping researchers develop a common language to exchange ideas and by training them in the use of state-of-the-art tools from cell-biology, time-resolved 3D imaging, discrete geometry, additive manufacturing and computational biophysics. This COST action will stimulate new research and inspire technical innovation having applications in understanding the progression of disease, tissue even in broader field of the efficient use and application of biological materials in sustainable applications.

Data-driven Applications towards the Engineering of functional Materials: an Open Network

CHAIR: Dr Kevin Rossi (NL) k.r.rossi@tudelft.nl

FUNDING PERIOD: September 2023-September 2027

SUMMARY

Current environmental, geo-political, and socio-economic challenges in the EU stem from a dependence of key technologies on critical and non-renewable materials. Discovery and commercialisation of innovative functional materials is needed to e.g. address energy production, storage and resilience, de-carbonise our economy to preserve ecosystems and climate, and switch current technologies to ethical and sustainable materials choices.

Data science and machine learning (ML) have recently boosted materials research in these areas, but we must urgently expedite development. In the DAEMON COST action, we will grow a cross-disciplinary and pan-European network, which builds capacity and promotes education and research coordination, with the goal of accelerating materials discovery in Europe by means of cutting-edge computational techniques and data-driven methods.

The objective of this action is to develop, harmonise, and promote the exploitation of ML methods for functional materials design. For targeted advancement, we build working groups around innovative ML approaches that hold the most potential for new discoveries, and integrate them with network members focused on immediate applications. The action will leverage the synergic expertise of theorists and experimentalists in material science, physical chemistry, condensed matter physics, and computer science. In the process, we will train a new generation of young European researchers in a multi-disciplinary and transferable array of data science methods, and unite our non-ITC and ITC teams in cutting edge developments. Dissemination events will promote immediate technology transfer to our industrial stakeholders, maximising impact and societal benefit.

EU-PoTaRCh – a network for forest by-products charcoal, resin, tar, potash

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

EU-PoTaRCh-establishes a network for the past, present and future of use of major non- timber forest raw materials and products in Europe. Whilst it will focus on forest by- products mainly Potash Tar Resin Charcoal (PoTaRCh)–as representatives of traditional forest exploitation heritage, it will touch upon other forest by-products (tannins, pitches). The scholarly vision is to enlighten the relevance of these products in history, especially their role in industrialization. The goal is to identify and assess production changes and their social and environmental impacts on sustainable development, and based on their heritage, to draw lessons for the future. Action will support stakeholders who know these products and are interested in them, as they use them in the production, education, and promotion of heritage. Due to the participation of stakeholders with significantly different activity profiles, and hence the needs (museums, state forests, associations, etc.), deliverables planned in the network are flexible and adapted to cooperate with stakeholders. They will receive deliverables that will accurately close the project and make it possible to measure its performance in relation to the assumed expectations. Emphasis will be placed on ITCs, which have a rich history of producing PoTaRCh. Men and gender balance mainly represent area of Action is upset. Therefore, special attention will be paid to mobilization of women who will act as leaders of WP, STMS and workshop organizers. Action will help to find ways to sustainable forest use and transfer knowledge to better methods and products in the bioeconomy.

Transformations international Experience and Research network for Sustainable futures

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The overarching aim of Transformers is to inform research, policy and practice for transformations that deliver justice in a changing global context by bringing together and positioning research relevant to societal transformation. Such societal transformations are cited as highly necessary to avoid catastrophic climate change and biodiversity loss, and are called for in the IPCC and IPBES frameworks, as well as the European Green Deal.

However, current research into transformations is highly fragmented. Pieces of relevant knowledge are held by policy-makers, practitioners, and researchers, from within across a range of contexts, disciplines, projects and perspectives, both within and outside of the sustainability research community. There is a need to put these separate pieces together to 1) identify what transformation-relevant knowledge is held and by whom 2) understand how the different pieces fit together; 3) understand what the big picture is – what we know about transformations collectively; and 4) identify the missing pieces – understand what we still need to create knowledge on. Transformers creates a networking infrastructure to meet these 4 needs with objectives to 1) inform transformation policy; 2) shape transformations research and practice; 3) train transformations researchers from across broad disciplines and topics.

Reproductive Enhancement of CROP resilience to extreme climate

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Climate change is a threat for food security as extreme weather phenomena will reduce the yield of all major crops. Grain and fruit crops which consist the core of human diet are particularly vulnerable due to the sensitivity of sexual reproduction process to abiotic stresses. Consequently, there is an urgent need to generate elite varieties with enhanced reproductive stress resilience. RECROP (Reproductive Enhancement of CROP resilience to extreme climate) is a team of agronomists, physiologists, geneticists, biologists, bioinformaticians and researchers from the field of Machine Learning from public organizations and private sector which will use holistic approaches to understand the grounds of crop sensitivity and design solutions for yield stimulation in the era of climate change. RECROP aims to: (1) Identify the genetic, molecular, and physiological makeup of the sensitivity of crop reproduction, (2) Create a roadmap for the generation of resilient crops, and (3) Provide guidelines of exogenous treatments to increase resilience in a sustainable manner and push the limits of the genetically inherited stress tolerance. The aims will be fulfilled by four Working Groups (WGs) which in addition to research discussions will organize training schools, workshops, conferences, and dissemination activities. RECROP will actively support Early Stage Career researchers through training and networking and support interactions with Near Neighbouring and partner COST countries. RECROP members will be actively involved in building communication channels with Policy Makers to provide scientific advice and support them in scientific-based context of future policies on biotechnology, technology and agriculture sectors.

Exploiting Plant-Microbiomes Networks and Synthetic Communities to improve Crops Fitness

CHAIR: Prof. Conceiçáo Santos (PT) csantos@fc.up.pt

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Europe faces an increased frequency of drought and heat waves and the appearance of new diseases. It's urgent to develop alternatives to current agricultural systems that highly depend on agrochemicals and water. CropBiomes grounds on the urgent need for transition to Sustainable Agriculture ensuring food Security and Safety, aligned with both GreenDeal and "Farm-to-Fork" strategy. CropBiomes gathers European experts to coordinate and develop knowledge on crop microbiomes (and holobiomes) for application in precision sustainable agriculture. It will exploit technological advances (eg, engineered microbiomes) to selectively improve the holobiomes' resistance to specific environments like drought and diseases. The knowledge of the crop as a "Holobiont" responsible for its fitness, as well as the technologies to explore "hub" taxa to potentiate community-scale networks, and the holobiome fitness, remain yet underexplored in agriculture.

CropBiome established six research objectives and 6 Capacity-building-objectives. The networking is transdisciplinary and balanced (e.g., gender, researchers-career, countries) and intersectoral, structured to generate long-lasting impact. The four Working Groups will go beyond the current state of the art in crop microbiomes. It will define new concepts on topics like plant-microbiomes' diversity, distribution, eco-evolution, cross-talks, and the microbiomes/holobiomes dynamics and cross-talks under specific environments like soilless systems and environmental stressors (drought/heat, pathogens). Finally, we'll explore the plant microbiome as a source of beneficial associations of microorganisms, and exploit technologies for engineering the microbiomes (through Synthetic Communities). The CropBiomes will gather senior and early researchers, and different stakeholders and contribute to the competitiveness of Europe in this field.

National, International and Transnational Histories of Healthcare, 1850-2000

CHAIR: Prof. Barry Doyle (UK) doylebmd@gmail.com

FUNDING PERIOD: September 2023-September 2027

SUMMARY

The current state of the art in the history of healthcare suggests a significant divide in terms of themes, approaches, methods and even sources between historians working in different parts of Europe. This reflects separate research cultures and networks shaped by long term approaches to the history of medicine including, the role of medic-historians, the social sciences, social and cultural history and even politics. Central to the Action will be scientific exchange around four research themes – Healthcare Provision, Healthcare Providers, Patients, and Finance – that will feed into the capacity building objectives.

These thematic working groups will integrate and finesse diverse methods and approaches and extend knowledge and understanding of experience and sources currently in use across Europe. Through training events, skills exchange and publications the project will create critical mass in the history of European healthcare, providing support and an academic environment for scholars at all stages of their career. It will establish a platform for their work that addresses the dominance of Anglophone publication and presentation opportunities; create core groups across the continent to exchange ideas and produce collective outputs; enhance opportunities for research students and early career researchers to experience diverse academic cultures and approaches; and institute collegiate mentoring structures that will reduce hierarchies dominated by seniority and promote fair and equal opportunities irrespective of race, gender, age or class. The core methodological approach we will use will be comparative history.

Enhancing knowledge of BIOmolecular solutions for the well-being of European AQUAculture sector

CHAIR: Ms Eva García Muntión (ES) evagarcia@rtdi.eu

FUNDING PERIOD: September 2023-September 2027

SUMMARY

A growing interest in the development of new technologies to foster the sustainability of aquaculture sector has arisen over the past decade, seeking alternative scientific and technical tools for fish-farm production. In order to assess the current status, our action aims at exploring the potential of biomolecular solutions for the well-being of European aquaculture sector, proposing an innovative conceptual pathway for veterinary applications, tracking systems, diagnosis or biosafety. For that purpose, the Action proposes to establish an innovative and dynamic European network connecting scientist, aquaculture industry and stakeholders to optimize information exchange, to develop a joint research agenda, to explore new advance research lines and to enhance the co- production among researchers and other industry and societal actors. Among the different activities and outcomes, the action will promote the visit to different aquaculture facilities and the development of an interactive website for knowledge exchange. Overall, the action will contribute to improve fish welfare and reduce costs related to critical circumstances (blooms, diseases, overuse of antimicrobials...).

Future of plant-based food: Bridging the gap of new proteins and FLAVOURsome

CHAIR: Dr Susana Soares (PT) susana.soares@fc.up.pt

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Modulation of food nutrients towards consumer preferences, and food system sustainability is one of the frontiers of Food Science. Plant-based foods are a major opportunity in pairing the naturally present health-promoting phytonutrients with providing alternative protein sources, allowing to reduce meat and dairy intake while reducing the emissions of carbon dioxide. However, it is well-known that plant-based food and proteins have undesirable flavour, namely bitter, astringency and green odour. So, while plant- based food and proteins are an opportunity of innovation for the food industry, they present a grand challenge to tackle: to maintain desirable flavour profiles aligned with minimum food processing.

FLAVOURsome Action is based on the creation of shared knowledge on flavour research to boost the innovation in the plant-based food industry. This Action will employ a concerted approach to encapsulate the knowledge from diverse expertise, to merge the correlation between research and sensory analysis, and to realign future research while fostering exchanges between academia and industry to fuel the development of innovative applications to be applied in the food industry. This Action will promote high level and multidisciplinary training, along with scientific and society dissemination to engage citizens at the centre of food systems change.

FLAVOURsome consortium joins world-leading experts covering the main disciplines involved in food flavour research. This results in an integrative, cohesive and multidisciplinary group of experts, stakeholders and companies. The envisaged knowledge transfer within and beyond Europe will ensure that Europe can stay at the forefront of flavour research and its applications.

FUTUREforMED: A TRANSDISCIPLINARY NETWORK TO BRIDGE CLIMATE SCIENCE AND IMPACTS ON SOCIETY

CHAIR: Dr Samira Khodayar (ES) khodayar_sam@gva.es
FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The Mediterranean is a climate change hotspot suffering severe consequences of global warming. Several types of risks are currently affecting the region, from frequent extreme weather events to coastal erosion from rising sea levels or increased pollution. In addition, climate change impacts also propagate as "cascades" across socio-economic sectors. In urban areas, such sequential or concurrent compounding hazards are more disastrous than single events. The impacts affect ecosystems, economic activities, and human health.

Despite the ubiquity of these connections, scientists and decision makers are typically working addressing isolated risks, advancing in parallel and missing added value from cooperative efforts. It is thus necessary to move beyond siloed approaches towards integrated efforts that promote effective science-based and agent-based decision-making. It is necessary to establish unprecedented networks of transdisciplinary partnerships, including scientific, human health, social approaches, to governance, and risk management. Such networks facilitate stakeholders and researchers to reach more accurate recommendations, strategies and policies addressing climate change impacts and risk management.

FUTUREforMed will foster new climate change-related science and synergies serving as a transdisciplinary and integrative platform effectively connecting scientific knowledge on high-impact weather (HIW) events and climate change impacts with stakeholders from priority socio-economic sectors such as energy supply and demand, agriculture, health and migration. For the first time, an Action coordinates a platform where scientific communities, key stakeholders and citizens can interact for the ends of promoting climate change impacts awareness, establishing future research priorities, and building capacities based on knowledge exchange in a living lab.

Solving bottlenecks in eel reproduction to support sustainable aquaculture

CHAIR: Dr Arjan Palstra (NL) arjan.palstra@wur.nl

FUNDING PERIOD: September 2023-September 2027

SUMMARY

World-wide, eel populations have decreased strongly in numbers since the 1970s. The eel farms still depend on catches of wild juvenile eels, or 'glass eels', which are then raised to market size. Only a restricted number of glass eels is available for aquaculture and societal concern exists about the unsustainable level of their harvesting. Successful propagation in captivity could supply aquaculture with glass eels and close the production cycle. Eel aquaculture can become sustainable then and, by releasing the natural population from fishing pressure, also contribute to sustainable management of the natural population.

With our international consortium of partners that has tremendous experience in eel research, we aim to share our knowledge and collaborate to force breakthroughs in the propagation of eel in captivity. This is an absolute necessity as the partners currently depend on national funding and lack an international networking umbrella. The COST Action EEL SUPPORT will use the available networking tools to jointly share the state-of- the-art, to identify knowledge gaps, to develop collaborative strategies to fill these gaps, and to synthesize and review this knowledge in order to: i) design optimal protocols for broodstock conditioning from glass eel to an eel in early puberty, or 'silver eel'; ii) design optimal protocols to artificially mature and propagate the eel to produce larvae, and iii) design hatchery technology for rearing larvae to the glass eel stage. This way, EEL SUPPORT will contribute to closing the production cycle and supporting sustainable aquaculture and management of natural populations.

European Network on Extreme fiRe behaviOr

CHAIR: Dr Theodore Giannaros (EL) thgian@noa.gr

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

While rare and large wildfires have occurred in the past, recent catastrophic events point to the emergence of novel fire regimes characterized by extreme wildfires. Researchers argue that these regimes are the new normal since they are associated with increasing size, intensity, and severity. Extreme fire behavior (very rapid fire spread, massive spotting, crowning, deep flaming, pyroconvection) characterizes this new wildfire context. Although there have been significant advances over recent decades in understanding extreme fire behavior, the deep knowledge gained falls short in predicting the intensity and size of recent extreme events. There is still much work needed to advance our capability to identify those situations where extreme fire behavior may occur. This is a challenging endeavor that calls for re-evaluating current knowledge and introducing new paradigms.

NERO will address this challenge by bringing together wildfire researchers and practitioners to advance the current state of the science, thus making a crucial step in improving fire management, firefighter training and safety, and public safety planning. NERO will establish and promote a new European culture that supports the effective transnational exchange of expert knowledge, including data and tools. More importantly, NERO will contribute to narrowing the gap between science and practice, thereby promoting efficient science-based wildfire management. To this end, it will exploit COST networking tools to train a new generation of highly qualified researchers and practitioners, specialised in addressing the challenges of the dawning era of extreme wildfires.

Redressing Radical Polarisation: Strengthening European Civil Spheres facing Illiberal Digital Media

CHAIR: Dr Maria Luengo (ES) maria.luengo@uc3m.es

FUNDING PERIOD: November 2023-November 2027

SUMMARY

Polarisation is an increasingly prevalent feature of liberal democratic societies. Ordinary liberal politics uses binary discourse that "otherises." However, the extreme "otherisation" manifest in intolerance, hostility, deep partisan animosity, and hate speech is becoming a threat to the civil virtues of tolerance, hospitality, openness, and to civil discourse. In the context of this political and civil divisiveness, there is now a widespread belief that digital media both contributes and exacerbates radical polarisation.

This Action aims to create an interdisciplinary network that will advance common understanding of radical polarisation and identify successful interventions to de-escalate uncivil and undemocratic partisanship. It will engage with civil and media organisations in order to ensure de-escalation, depolarisation, and pluralism, through a multifaceted approach to strengthening democratic values in Europe.

By applying the lenses of cultural sociology and civil sphere theory, the Action adds an eminently normative and interpretive character to existing literature on the topic. This theoretical scaffolding will contribute to understanding online polarisation. While there is no conclusive research on the impact of digital media on polarisation, if radical polarisation can be confined, on the grounds of commonality and plurality, to an issue-by-issue basis, it might be able to harness the agonistic energy of radical polarisation, while disarming its antagonistic potential.

The Action will provide a toolkit that brings together civil-communicative depolarisation skills, guidelines on how to avoid engaging unintentionally in increasing polarisation through inadequate messaging and reporting, as well as examples of best practice to reduce radical polarisation successfully where it already exists.

Safety in the Game Meat Chain

CHAIR: Dr Anneluise Mader anneluise.mader@bfr.bund.de

FUNDING PERIOD: September 2023-September 2027

SUMMARY

With 7 million hunters in the EU alone, hunting is a commonly performed activity in most European countries. However, scientific knowledge on the food safety of game meat and the game meat production chain in Europe is limited. Although the game meat market is small compared to that of livestock meat, almost monthly a notification in the European Rapid Alert System for Food and Feed arises.

Applying a transnational and multidisciplinary One-Health approach, the COST Action "Safety in the Game Meat Chain" will enable the exchange of experiences and concepts through networking, thereby promoting the strengthening and harmonization of food safety standards in a growing European game meat market. The network will consist of all relevant stakeholders along the game meat chain and aims to determine differences and similarities between European countries in hunting practice and education, game meat processing and inspection, trading, legislation, and game meat consumption investigating all stages of the supply chain: from the wild animal to the consumer, "from forest to fork". A particular focus is on the identification and assessment of known and emerging chemical and biological risks that are of regional, national or global importance and pose a hazard to human health associated with the consumption of game meat.

Overall, the network aims to support informed decisions in regional, national and international risk assessment, management and communication on game meat safety by creating a comprehensive knowledge base and providing concrete recommendations for action, which will contribute to strengthening food safety and consumer protection across Europe.

Participatory Approaches with Older Adults

CHAIR: Dr Anna Urbaniak (PL) anna.urbaniak@uek.krakow.pl

FUNDING PERIOD: October 2023 - October 2027

SUMMARY

There is a significant international commitment to give non-academics a greater role in science to help deliver impactful research and realise the European vision of science for the people, by the people. To support this commitment, the PAAR-net COST Action focuses on knowledge co-production, labelled here as participatory approaches, in research, policy-making and practice. It focuses on research, policy and practice intervention designs by experts-by-training (usually academics) and experts-by-experience (usually non-academics). We focus on a specific group of experts-by-experience who are often not included in research (James & Buffel, 2022), namely older adults (aged 65 and older, including those at risk of social exclusion). This COST Action aims to further develop participatory approaches with older adults as a means of driving inclusive social innovation across research, policy, and practice, for heterogenous and fair ageing societies. PAAR- net aims to gather, exchange and advance knowledge on participatory approaches with older adults (including those at risk of social exclusion) by asking the following questions:

How can we meaningfully involve diverse groups of older adults to contribute their perspectives and experience (including those at risk of social exclusion) in participatory approaches to research, policy and practice development?

How do participatory approaches with diverse older adults (including those at risk of social exclusion) impact research process and the quality of data gathered?

How do participatory approaches impact those (academics and non-academics) involved in research (e.g., wellbeing, reciprocal learning, emancipation)?

Through this PAAR-net shifts the focus from an exclusionary framework to a participatory framework in thinking of older age.

Physical layer security for trustworthy and resilient 6G systems

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FUNDING PERIOD: September 2023-September 2027

SUMMARY

Other than simply inheriting vulnerabilities from the previous generations, 6G will face new threat vectors, including in the radio and massive Internet of things (IoT) domains. The COST action PARADIGM will thus focus on creating a European network of academia and industry experts that helps the development of trustworthy and resilient 6G that can instill trust, secure communications and privacy by proposing novel physical layer security (PLS) solutions.

The premise of PARADIGM is that in 6G, intelligent and adaptive security controls are needed at all layers, with adaptation enabled by the distillation of semantics and context. The focus of this Action is on exploiting the characteristics of physical phenomena to provide security functionalities; PLS can complement upper-layer security schemes to strengthen the overall system security and enhance trust. The Action will study the characteristics of different physical environments and hardware properties to develop efficient methods to authenticate users and devices and to provide key-based or keyless confidentiality schemes. This Action will also investigate the interplay between PLS and advances in artificial intelligence, joint communication and sensing, semantic communications and context awareness.

To enhance the trustworthiness of 6G, starting from the physical and hardware layers, PARADIGM forms a large network of internationally renowned experts in wireless communications and security, from both academia and industry. The Action has also involved researchers across the whole of Europe and has included distinguished international partners with established expertise. The Action promotes inclusiveness by welcoming the participation of young researchers and female researchers in particular.

EUropean network to tackle METAbolic alterations in HEART failure

CHAIR: Prof. Christoph Maack (DE) maack_c@ukw.de
FUNDING PERIOD: October 2023 - October 2027

SUMMARY

The COST Action "EUropean network to tackle METAbolic alterations in HEART failure" (EU-METAHEART) will bring together excellent researchers from Europe to contribute a broad spectrum of scientific expertise, cutting-edge technologies, scientific exchange and education to foster breakthrough science that moves the field forward towards improving the treatment of patients with heart failure. By sharing diverse expertise that cover not only conventional analyses of metabolism and mitochondrial function, but also omics-based approaches towards genetics, epigenetics and metabolism and in particular, integrated assessment of excitation-contraction coupling with mitochondrial redox control and energetics, as well as advanced in vivo imaging technologies, the novelty of this COST Action is that it will allow to develop a comprehensive and cutting-edge approach towards deeper understanding of metabolic dysfunction in HF. We have identified four scientific key areas to which metabolic or mitochondrial dysfunction are central, which will be addressed by four working groups (WGs):

1. Impact of metabolic disorders on substrate and intermediary metabolism in cardiac myocytes
2. Metabolic aspects of vascular dysfunction
3. Immunometabolism: how metabolic alterations control inflammation and vice versa
4. Mechano-energetic uncoupling and mitochondrial redox alterations

These research areas are tightly intertwined and can hardly be investigated in isolation (from each other). Therefore, EU-METAHEART will employ an integrative approach to bring all these research fields under one umbrella. The working groups focus on their respective four topics, but benefit from the expertise in the respective other WGs to overcome scientific and methodological boundaries and rapidly move the field forward towards drug development.

TEndon Regeneration NETwork

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FUNDING PERIOD: October 2023 - October 2027

SUMMARY

Musculoskeletal disorders/diseases are among the main causes of disability worldwide and are exacerbated by an increasingly sedentary lifestyle and ageing population. Among these, tendinopathies, account for 30-50% of musculoskeletal-related primary care visits worldwide. These diseases produce pain, swelling and restricted ranges of motion, and affect individuals across ages in their work and leisure time. The estimated costs to European Union healthcare systems are in excess of 800 M€ annually. Despite the impressive progress achieved on the development and translation of regenerative therapies for specific applications, major progress in designing and translating clinically- relevant advanced regenerative therapies for tendon is still missing. The lack of coordination and scattering of research and knowledge in the field of tendon mainly justifies the disappointing results attained so far.

The main aim of TENET Action is to create the TEndon regeneration NETwork, a scientific network of excellence mainly based in Europe integrating academics, research laboratories, clinicians, biotechnological companies, and regulatory bodies to foster the scientific and industrial capacity to develop, test and translate advanced regenerative therapies to promote tendon tissue regeneration and restoration of tendon function. This Action will bring together sufficient expertise and critical mass to produce an integrated, coordinated and multidisciplinary response to the challenges in the field. This will allow the full deployment of advanced regenerative therapies for tendon, not only to respond to open scientific questions, but more importantly to boost the clinical translation of these therapies in order to improve patient treatments and outcomes.

COST Actions starting in 2022
(and finishing in 2026)

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA21101	■	■					88
CA21102						■	89
CA21103		■					90
CA21104	■	■			■		91
CA21105	■		■				92
CA21106	■						93
CA21107					■		94
CA21108	■	■	■				95
CA21109	■						96
CA21110			■				97
CA21111	■	■	■	■			98
CA21112	■	■					99
CA21113			■				100
CA21114					■	■	101
CA21115	■						102
CA21116			■				103
CA21117			■				104
CA21118	■				■		105

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA21119	■	■					107
CA21120					■	■	109
CA21121		■					110
CA21122			■		■		111
CA21123			■				112
CA21124				■			113
CA21125	■				■		114
CA21126	■						115
CA21127		■					116
CA21128	■						117
CA21129					■		118
CA21130	■		■				119
CA21131	■				■	■	120
CA21132	■		■	■			121
CA21133					■		122
CA21134				■			123
CA21135			■				124
CA21136	■						125

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA21137			■			■	126
CA21138	■			■			127
CA21139	■		■	■	■		128
CA21140			■				129
CA21141					■		130
CA21142	■	■		■			131
CA21143					■		132
CA21144	■						133
CA21145	■		■				134
CA21146	■	■					135
CA21147		■	■				136
CA21148	■	■					137
CA21149			■	■	■		138
CA21150					■		139
CA21151	■						140
CA21152		■	■				141
CA21153	■		■				142

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA21154	■						143
CA21155		■					144
CA21156		■					145
CA21157				■			147
CA21158	■			■	■		148
CA21159		■					149
CA21160	■						150
CA21161						■	151
CA21162	■	■					152
CA21163	■				■		153
CA21164		■	■				154
CA21165	■		■				155
CA21166					■	■	156
CA21167	■					■	157
CA21168			■				158
CA21169	■		■				159
CA21170	■		■				160

CONFINED MOLECULAR SYSTEMS: FROM A NEW GENERATION OF MATERIALS TO THE STARS

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

This e-COST Action aims to provide a computationally and experimentally sound foundation for the fundamental understanding and control of confined molecular systems. The resulting outcome will be translated into useful knowledge forming the basis for applications. These range from creating a new generation of materials including bio- materials, with immediate transfer to industry, to disclosing the chemistry occurring in space. To this end, we will combine new cutting-edge experimental techniques for the synthesis of novel nanomaterials and high-resolution characterization thereof, with state-of- the-art first principles modelling. The most advanced methods for molecular motion as well as modern artificial intelligence, machine learning technologies, and big data science will be applied. COSY will tackle these and other challenges through five strongly correlated work packages: 1. Accurate description of the intermolecular interaction between a molecule and its confining environment through modern first principles tools. 2. Efficient description of molecular motion in confined structures, including coarse- grained, atomistic, and meso-scale molecular dynamics of metal-organic frameworks and biomolecular environments. 3. Synthesis and characterization of the stability and novel properties of metal and metal- oxide nanoparticles and subnanometric clusters for applications such as luminescence, sensing, bio-imaging, theranostics, energy conversion, and (photo-) catalysis. 4. Synthesis, deposition, and properties screening of high-purity innovative nanomaterials, using the very cold and practically inert environment provided by superfluid helium nanodroplets. 5. Accurate characterization of phenomena of astrochemical relevance such as the chemistry and physics occurring on the confining surface of interstellar clouds, using the most advanced spectroscopic techniques, and the highest level ab initio theories and methods for quantum nuclear motion.

https://cost-cosy.eu

Toolkit of Care

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The Covid-19 pandemic has further exacerbated existent inequalities worldwide. The cultural sector, which is very often described as precarious work, is one of the worst hit.

The arts have been particularly hit hard by the pandemic in Inclusiveness Target, and Near Neighbour, countries, where governments provide minimal, if at all, financial support to creative practitioners and NGOs. More than just affecting the cultural production of these particular countries, there are international ramifications in that the rest of the world is also denied easy access to creative/technological advances and innovation that still takes place in the former – in other academic or other contexts. It is, then, especially relevant and timely to form critical networks of care within the creative industry of support communities. An interdisciplinary group of creative practitioners, academics, researchers and arts/crafts organisations that specialise in creative technologies and that have considerable experience in the production and dissemination of this kind of knowledge across Europe and internationally, have come together to form a "critical network of care". The Action's network will collaborate to share their collective expertise and technical knowledge employed in creative ways to develop knowledge and methodologies of care. The main aim is to produce a well formulated and integrated TOOLKIT OF CARE and comprising articles, prototypes, audiovisual documentation, technical manuals, theoretical analysis, prototypes, and data. It will act as a model of how to successfully share knowledge and expertise across different geographical regions and social groups.

http://toolkitof.care/

Implementation of Circular Economy in the Built Environment

CHAIR: Prof. Luis Bragança (PT) braganca@civil.uminho.pt
FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Governments and society require a more efficient and sustainable built environment. An emergent trend is the Circular Economy (CE), which aims at decoupling economic growth from resource consumption. Construction has been identified as a field of action by the European Commission's Circular Economy Action Plan (CEAP). However, the lack of a common understanding and open tools to classify buildings' circularity, at any stage in their lifecycle, is a barrier in the application of circular thinking. Thus, this Action aims at defining the methodology to develop an international circularity framework for new and existing buildings to support decision making and assess the implementation level of CEAP. It will be based on Key Performance Indicators (KPIs), selected according to international best practices, current CE state-of-the-art, CEAP, and COST countries' construction practices. The KPIs framework will be developed with enough flexibility to be locally applied by different COST countries or regions. To accomplish this, a benchmark database will be developed (based on each country conditions, culture and traditions), allowing for the direct use of the KPIs to support both designers in developing more sustainable buildings and national/local governments in assessing and promoting their CE targets, as well as evaluating how CEAP is being implemented in practice. The KPIs will also be integrated into the Open BIM workflow for use in BIM models. Construction, assembly, adaptability, de-construction, value chain management and CE business models guidelines will be developed for new and existing buildings to enhance and promote stakeholder's knowledge.

www.circularb.eu

Pan-European Network for Sustainable Hydropower

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Hydropower (HP) played an essential role in Europe over decades, providing a unique combination of safe, low-cost, and clean electricity production. It is still one of the largest renewable energy sources (RES), adding up to about 35% of the electricity generated from RES. Predictions show that by 2024-2025 all RES will contribute almost 34% to the worldwide electricity production, and HP will provide approx. 50%. Europe shows an almost equal share of electricity from volatile wind (36.5%) and predictable hydropower sources (34.3%) for 2019. This trend of an increasing quantity of unregulated energy (wind plus solar) involves market requirements for flexibility and dynamics such as energy storage and fast response. In that case, HP has the potential to balance a renewable energy system on a short term (seconds to minutes) and on a medium to long term (months or even years) basis by using pumped-storage technology. New requirements in terms of operation and maintenance of Hydropower plants as well as co-generation of electricity with other RES needs substantial future research. As past funding of research projects was low, this new initiative should work together for a better knowledge exchange, capacity building of young researchers to meet the needs of the future.

The main objective of this Action is to establish a Pan-European network for a sustainable, digitalised Hydropower contributing to the Clean Energy Transition (CET), a united network of researchers, engineers, scholars, and other stakeholders, such as representatives from industry, policy and civil society, to facilitate close collaboration among European research groups through projects supporting sustainable Hydropower.

https://www.pen-hydropower.eu/

Blastocystis under One Health

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Blastocystis colonizes at least one billion people making it the most prevalent intestinal microbial eukaryote. Emerging data indicates higher prevalence in animals. A high proportion of carriers are asymptomatic. Despite numerous studies, pathogenicity of Blastocystis remains controversial. Currently, at least 26 genetic subtypes (STs) exist. Of these, ST1-ST9 and ST12 have been found in humans, while the rest have been isolated only from non-human hosts. Information on prevalence, geographic distribution and host specificity of STs is incomplete. Significant gaps also exist on environmental presence of Blastocystis. Collectively, this paucity of data blurs the Blastocystis landscape considerably. The specific objectives of this framework are to: (1) Support advancement of Blastocystis research by bringing together professionals from various disciplines and countries; (2) Foster information sharing on current methodologies, especially in the areas of subtyping, host-Blastocystis-microbiome interactions and Blastocystis-omics; (3) Promote capacity building via a transdisciplinary network of international collaboration; (4) Open avenues of communication with veterinarians, physicians and general public. By the end of this initiative, participants will be able to: (i) Apply state-of-the-art tools for molecular identification of Blastocystis; (ii) Harmonise methodologies for subtyping Blastocystis and identifying its role within the gut; (iii) View Blastocystis under One Health approach; (iv) Generate novel hypotheses to test role of Blastocystis in the gut ecosystem, health and disease.

https://blastocystis-cost.com/

COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Axions and other very weakly interacting slim (m<GeV) particles (WISPs) are easily accommodated in several extensions of the Standard Model of Particle Physics. They may be non-thermally produced in the early universe and survive as constituents of the dark universe. The aim of this Action is an exhaustive study of these WISPs, notably axions, axion-like particles (ALPs) and hidden photons (HP), ranging from their theoretical underpinning, over their indirect observational consequences in astrophysics, to their search at colliders and beam-dump and their direct detection in laboratory experiments. Searches for WISPs are strongly motivated by our attempts to understand the nature of the dark matter and puzzling astrophysical and particle physics observations. A rich, diverse, and low-cost experimental program is already underway that has the potential for one or more game-changing discoveries. The aim of this Action is to coordinate and support WISPs searches in a synergic way at the boundary between particle physics, astrophysics and cosmology. It will provide a platform to benefit from the latest data from laboratory and astrophysical experiments. It will also offer a guidance for experimental efforts and theoretical investigations dealing with fundamental questions, like the strong CP problem and the nature of the dark matter.

https://cosmicwispers.eu/

Work inequalities in later life redefined by digitalization.

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The aim of this Action is to enhance scientific knowledge and attention to the topic of aging at work in the era of digitalization by integrating the different disciplines and schools of thought, by developing collaborations with public policy officials, international policy bodies, non-academic professionals, civil society NGOs, trade unions, management of organisations and older workers themselves. These objectives will be met by stimulating scientific and public interest, and by developing a new generation of researchers in the field. Expected deliverables include: a) the creation of an internet-based web-site; that will act as a platform for the Action and become an international 'hub' for the study of ageing at work in the era of digitalization, by sharing and publishing knowledge, connecting researchers, stakeholders and activists in the field; b) the creation of a depository database of scientific measures and tools for the assessment of inequalities and challenges of aging and digitalization, as well as for good practices. Policy reports will be posted in order to make links outside the research community to address policy makers and stakeholders; c) the facilitation of research and dissemination events, including Short Term Scientific Missions (STSMs) and scientific Training Schools (TS) for Early Stage Researchers (ESRs) and established researchers, public conferences and policy workshops hosting experts and relevant stakeholders from COST and International Partner Countries (IPC); and d) a series of publications including scientific reports, conference proceedings, academic publications, collaborative recommendation papers derived from Action Working Groups, and an edited book.

https://digineteu.eu/

European Network for Skin Engineering and Modeling

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Over the past years, investigative and experimental dermatology has developed various approaches, ranging from utilisation of ex-vivo skin tissues to establishment of reconstructed in-vitro and in-silico skin models as tools in both basic and translational skin research. These models have the strong potential to increase the significance of scientific and clinical outcomes and to reduce animal experimentation. Nevertheless, current skin models lack sophistication and standardisation, thereby hampering their wider acceptance by the scientific community and regulatory bodies. This is partly caused by a lack of cross talk between relevant stakeholders – regulatory bodies, basic scientists, clinicians, and industry – whereby advances in new technologies have not delivered their full potential in this field. In the proposed Action, interdisciplinary and intersectoral research and coordinated initiatives will drive the development and validation of standout sophisticated cell-based and computational skin models, including the development of artificial intelligence models for dermatological research. Furthermore, the Action has ambitions to develop ethical and sustainable reagents required for the elaboration of organotypic skin models, based on a strong partnership between network academia and industries. Harmonisation of scientific and technological knowledge and an enduring bottom-up dynamic in the field will be ensured by dissemination of leading-edge know-how among research intensive and research moderate European territories. Moreover, next-generation scientists will be trained for the long-term propagation and continued development of skin models. Action outcomes will turbocharge the field of skin models to meet rising scientific, clinical, economic, environmental and regulatory expectations, making Europe the epicentre of research in this field.

Cartan geometry, Lie, Integrable Systems, quantum group Theories for Applications

CHAIR: Prof. Rita Fioresi (IT) rita.fioresi@unibo.it

FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Symmetry is a central unifying theme in mathematics and physics. In this proposal we focus our attention on symmetries realized through Lie groups and Lie algebras. In addition to the spectacular achievements in representation theory, and differential geometry, Lie theory is also exceptionally important for the formalization of fundamental physical theories. CaLISTA aims to advance cutting-edge research in mathematics and physics through a systematic application of the ideas and philosophy of Cartan geometry, a thoroughly Lie theoretic approach to differential geometry. In addition to making major progress in Cartan geometry itself, CaLISTA aims to develop crucial applications to integrable systems and supersymmetric gauge theories. Quantum groups and their quantum homogeneous spaces come into the play as a bridge between these topics: quantum groups stem originally from the R-matrix formulation in integrable systems, and their homogeneous spaces offer prototypical examples of noncommutative parabolic geometries. Parabolic geometry is the first and possibly the most important example of Cartan geometry, and one of the main aims of CaLISTA is to obtain a quantum generalization. Surprisingly, Lie theory and Cartan geometry play a role in an exciting new interpretation of the differential structure, and related dynamics, of models for popular algorithms of vision like Deep Learning and the more recent Geometric Deep Learning. CaLISTA aims to investigate and improve on these techniques. CaLISTA will provide essential mathematical models with far-reaching applications, placing Europe among the leading actors in these innovative research areas.

https://site.unibo.it/calista/en

Building an open European Network on OsteoArthritis research

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Osteoarthritis (OA) is the most common form of arthritis and the single most common cause of pain and physical disability in older adults. An estimated 10% to 15% of all adults aged over 60 have some degree of OA, with prevalence being higher among women than men and likely representing underreporting which is common in many disease prevalence studies. Despite the growing OA epidemic and major socio-economic impact, the population is facing a staggering lack of disease-modifying therapies that can bring symptomatic relief and preserve joint function by preventing cartilage- and joint degeneration and thus delaying OA progression. The research specifically aimed at OA management in Europe is scattered and not strategically coordinated, although several networks have OA partly in focus, it minor part of their agenda en lacks the focus and dedicated commitment to coordinate progress. The main aim of EU-netwOArk is to set up the European Society for Osteoarthritis (ESOA), with three major stakeholder groups, 1) patients, 2) clinicians and 3) researchers, both from academia and industry. The COST Action will allow us to start the process of building such a European Society, with the aim of coordinating and stimulating more interdisciplinary and transdisciplinary research, technological development and translation of the results to the clinic, aimed at improving the quality of life of those affected by OA in Europe. The area's to be addressed in this Action are Primary prevention, Diagnostics, Treatment, Interaction (comorbidities) and Care Management. EU-netwOArk aims to boost new scientific breakthroughs on the five main OA themes.

https://netwoark.eu/

One Health drugs against parasitic vector borne diseases in Europe and beyond

CHAIR: Prof. MARIA PAOLA COSTI (IT)
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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The recent COVID19 pandemic infection has undisclosed long-standing issues in the translation of drugs from animals to humans or vice-versa. Nearly 75% of emerging human infections worldwide originated from animals; existing drugs for human and animal (H&A) vector-borne diseases (VBD) are scarce, with limited efficacy, toxicity, and finite resources. Emerging environmental problems in pharmaceutical use/manufacturing increase attention in the field. The two drug pipelines are developed independently. Hence, cooperation is needed among different expertise to define how it is possible to develop new drugs in a more sustainable approach.

Drugs4VBD aims at coordinating the discovery of drugs halting H&A VBD keeping with the principles of optimal profile for both organisms, increasing the quality and delivery technologies The COST Action is the ideal platform aiming at the integration and generation of synergies among drug R&D experts from the chemical/biological/ earth and veterinary science within academies, SMEs, industries, governments. The platform encompasses pre-clinical drug discovery, animal studies, and drug delivery. Strategies such as bioinformatics, PROTAC, nanotechnology will be enhanced.

DrugsxVBD will impact Europe and in disease-endemic countries. The Action will provide a compounds database and a white chart about the discovery of new drugs for H&A infections. Expected benefits include the transfer of academia-industry and Northern-Southern world knowledge. Conferences, training schools for advanced technologies, and STM are planned. Novel communication technologies to disseminate the Action results to a broad audience including scientists, stakeholders, and citizens are planned. ECIs will be trained on advanced techniques and the sharing of novel ones.

https://onehealthdrugs.com

Offshore freshened groundwater: An unconventional water resource in coastal regions?

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Freshwater resources in coastal regions are under enormous stress due to population growth, pollution, climate change and political conflicts, and many coastal cities have already suffered extreme water shortages. OFF-SOURCE will address if and how offshore freshened groundwater (OFG) – groundwater stored in the sub-seafloor with a total dissolved solid concentration below that of seawater – can be used as an unconventional source of freshwater in coastal regions. Specifically, the Action will identify where OFG is found in waters of COST Member Countries and in which volumes, delineate the most appropriate approaches to characterise OFG, identify the most cost-effective strategy to utilise this resource, and assess the environmental and legal challenges to sustainable OFG use. These activities will be carried out by a new scientific, gender-balanced and inclusive network of experienced and early-career scientists and stakeholders from ten diverse and complementary scientific disciplines. Such a network will foster cross- disciplinary and inter-sectoral interaction between currently isolated fields of research to reduce the gap between science, policy making and society. This interaction will enhance the development of new ideas and concepts that will lead to breakthroughs in OFG characterisation and exploitation, translate into future market applications, and deliver recommendations to support effective resource management. By providing high quality training opportunities for early career investigators, particularly from less research intensive countries, the Action will develop a pool of experts to address future scientific challenges related to OFG. The Action is ultimately expected to enable Europe to become a global leader in OFG research and exploitation.

https://off-source.eu/

Genome Editing to Treat Humans Diseases

CHAIR: Dr karim benabdellah (ES) karim.benabdel@genyo.es

FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Recent advances on genome editing (GE) technologies have opened the possibility of treating diseases through precise modifications of patients' genomes. Impressive results have been achieved on animal models of several genetic disorders, infectious diseases as well as cancer and several clinical trials are already on going. However, the inadequate integration of the results of academic research into the research development strategy of pharmaceutical companies, the insufficient interest of academic institution in regulatory science and the absence of established standards to well acceptable risk- benefit ratio by regulatory agencies, preclude its general application for treating human diseases. Therefore, the translation of the GE technologies to address public health needs, require a strong collaboration between basic and clinical research, regulatory bodies and the different stake holders involved for each application. There are several networks to improve or analyse GE technologies for different applications, however, no one cover all the actors involved in gene therapy translation. The principal aim of the GenE-HumDi Action is to bring together pharmaceutical companies, academic institution, science and regulatory agencies, biotechnology firms, patient advocacy association and information technology, in order to tackle knowledge fragmentation with the aim to accelerate the translation of GE technologies to the treatment of human diseases.

https://www.genehumdi.eu/

CLIL Network for Languages in Education: Towards bi- and multilingual disciplinary literacies

CHAIR: Prof. Julia Hüttner (AT) Julia.Huettner@univie.ac.at
FUNDING PERIOD: October 2022 - October 2026

SUMMARY

This Action responds to the move into mainstream education of Content-and- Language-Integrated-Learning (CLIL), i.e., the teaching of non-language subjects through a foreign language. Ongoing challenges in CLIL practice and research negatively affect the realisation of CLIL's full potential, which lies primarily in helping school-leavers achieve the competence to use at least one foreign language confidently for professional and academic purposes. Young Europeans clearly require such bi/multilingual disciplinary literacies, complementing that in their first language, to succeed in employment and higher education.

Through connecting researchers across Europe, this Action will develop an impactful, shared research agenda and dissemination strategy, targeting CLIL's educational potential to support the development of bi/multilingual disciplinary literacies. This Action, for the first time, integrates research clusters from Language Education, focusing on CLIL and Subject Education experts working on education through the main language of education. To allow for a holistic understanding of the use and development of bi/multilingual disciplinary literacies, further expertise on digital media and multilingual schools is included.

Aims of this Action are to:

1. develop a shared conceptualisation and research agenda for the investigation of bi/multilingual disciplinary literacies in CLIL
2. provide an accessible collection of standardised research instruments and research training
3. identify patterns of use, development and existing good practices in terms of supporting bi/multilingual disciplinary literacies at school, focusing on grades 5-13
4. disseminate information on supporting the development of bi/multilingual disciplinary literacies in CLIL classes primarily to educational stakeholders and within academia, but also to post-secondary and industry stakeholders and the general public

https://www.clilnetle.eu/

Iron-sulphur (FeS) clusters: from chemistry to immunology

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

FeS clusters are the oldest biological cofactors. They play a role in various cellular processes, in all steps of the innate immune response to pathogens and the replication process of many viruses like SARS-CoV-2. Consequently, understanding the chemistry and biology of FeS clusters is essential for understanding the mechanism of cell development, the functioning of the immune response to pathogens, and the viral replication process. To elucidate the roles of FeS clusters and proteins in these processes and use the fundamental knowledge for developing therapeutics, we aim to build a coordinated effort applying multidisciplinary approaches combining stem cell biology, immunology and virology, metabolomics, bioinorganic chemistry, and computational and medicinal chemistry. The resulting knowledge will reveal new therapeutic targets or approaches to treating many human diseases, including viral infection, neurodegeneration and cancer. Bridging these fields is not possible without access to a Network, where experts in these fields can share their findings, exchange ideas, and develop new research agendas and projects.

This Action aims to coordinate a multidisciplinary pan-European Network to address the challenges, bringing together the required expertise across Europe. The Action will create a unique opportunity to develop new joint research projects, build knowledge utilization activities, access facilities and infrastructure, and support next-generation leaders and scientists. We expect that in the long-term, the S&T activities of the Action generate new translational research and development to help Europe lead the path towards treating infectious diseases like COVID-19.

https://www.fesimmchemnet-cost.com/

Identification of biological markers for prevention and translational medicine in pancreatic cancer

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Pancreatic cancer (PC) has a high mortality rate and is projected to become a massive public health problem in Europe. This Action will boost research on prevention of PC, particularly in the discovery of genetic risk factors, risk stratification, identification of biomarkers for early detection and patient monitoring, elucidation of biological mechanisms and functional pharmacogenomics for personalized medicine. These aims will be attained by expanding an existing interdisciplinary network.

The Action will be organized in the following working groups:

- Disease risk profiling. This WG will use germline genetic variants, epigenetics, transcriptomics and environmental factors to model disease risk and apply risk stratification scores to better select individuals eligible to be screened for PC or its precursors.
- Non-invasive biomarkers. This WG will apply state-of-the-art liquid biopsies for the detection and characterization of circulating tumor cells and DNA, tumor-derived exosomes, tumor-educated platelets, epigenetic markers, and will test their diagnostic value for PC precursors and early-stage PC.

Tumor profiling. Genomic, epigenomic and transcriptional profiling of PC and its precursors in a multiregional analysis fashion will be used to identify novel biomarkers with prognosis and predictive value for PC patient stratification. Functional genomics and therapy. This WG will functionally validate candidate genetic variants from germline or tumor studies by using cutting-edge approaches such as CRISPR-Cas9 gene editing. It will also generate novel approaches such as organoids / zebrafish avatars to implement (chemo)therapeutic strategies based on the patient in an effort to implement personalized medicine for PC.

The role of IMMUnity in tackling PARKinson's disease through a Translational NETwork

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Parkinson's disease (PD) is a widespread chronic disease affecting 600 000 people in the EU. It has no cure, hence patients rely only on symptomatic treatments. By consequence PD relentlessly results in serious disability, poor quality of life for patients, families and caregivers, causing high individual and societal costs.

PD etiology is largely unexplained and several pathogenetic hypotheses have been explored. The role of the immune system has been suggested by important studies, showing significant changes in both central and peripheral immunity. Several approaches exist to target the immune system, thus – would the contribution of immunity in PD be clarified – novel therapeutics could be developed. Currently only few research groups study the role of the immune system in PD; however methodological and technical approaches are highly variable. Moreover, networking and exchange of expertise between groups working on immunity in different pathologies is still underdeveloped, with the consequence that precious advances are not fully exploited or even precluded. The sharing of experiences, also taking advantage of the efforts made in similar neurodegenerative conditions, will provide unprecedented advantages.

IMMUPARKNET focuses on such challenges and aims at establishing an innovative, multi- interdisciplinary Network, fostering exchange of expertise among outstanding experts, from different countries and institutions, involving scientists studying immunity in PD but also immunity in other neurodegenerative diseases. IMMUPARKNET will thus establish a first nucleus of a multidisciplinary ecosystem to fight the fragmentation of efforts and approaches, both in research and clinical practice, for boosting research towards the development of innovative treatments for PD.

www.immuparknet.eu

Platform Work Inclusion Living Lab

CHAIR: Dr Mayo Fuster Morell (ES) mfuster@uoc.edu

FUNDING PERIOD: September 2022 - September 2026

SUMMARY

The platform economy (PE) has accelerated following the COVID-19 outbreak. Although several PE models exist, the PE predominant model is mostly characterised by poor working conditions, low pay, lack of social protection for workers, and increasing gender, racial and socioeconomic inequalities.

The main objective of the Platform Work Inclusion Living Lab (P-WILL) is to build a pan- european interdisciplinary and transdisciplinary multistakeholder network including policymakers, industry leaders, civil society organisations, designers, researchers, and the main initiatives happening at the international level, to foster the upsurge of alternative scenarios in the frame of platform work.

P-WILL promotes the PE intersectional gender perspective and inclusion through increased well-being, economic justice, and rights for the traditionally excluded collectives (TEC) while aligning the PE with The EU Pillar of Social Rights and SDGs.

The aims of P-WILL are:

- To discuss and critique current elements of the discourse on platform work, incorporating an intersectional feminist approach and proposing a richer and inclusive definition of the phenomenon.
- To favour an interdisciplinary social and technical approach to PE.
- To develop a deeper understanding of the impact of the expansion of the PE connected to COVID-19 on traditionally excluded collectives.
- To foster transdisciplinary PE action-oriented evidence-based outcomes closing the gap between society, science, industry and policymaking through co-creation of novel, bottom-up ideas to challenge and improve policymaking institutions recommendations, alternative platform design models and technical design guidelines.

- To establish grounds for further research development heeding The European Pillar of Social Rights and SDGs, strengthening European research and innovation capacities.

http://www.pwill.eu

International network for harmonization of atmospheric aerosol retrievals from ground based photometers

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Aerosols are particles floating in the Earth's atmosphere linked with the largest uncertainty on estimates and interpretations of the Earth's changing energy budget. Measurement principles differ depending on the desired derived aerosol optical parameter and on the measurement platform (surface or space).

The common aerosol columnar properties retrieval techniques, consists of direct measurement of a bright source of radiation (sun, star, moon, sky) with a multi-wavelength photometers. Several global photometric aerosol networks exist. However, there are several instrumental, algorithm and hardware based differences on their related aerosol products and a global standardization is needed. In addition, in order to improve and optimize sun- and moon- photometric aerosol measurements, a network of aerosol scientists and operators, aerosol measurement users and software, hardware developers is needed.

The objective of "HARMONIA" action is to establish a network involving institutions, instrument developers, scientific and commercial end users, in order to improve and homogenize aerosol retrievals using mainly solar and sky but also lunar and star photometers from different networks. It aims bridging user needs and the science and technology expertise residing in academia and industry, through:

- Increasing the interactions and knowledge exchanges between several atmospheric aerosol network measurement scientists and users
- Standardizing and improving of existing aerosol products and tools, towards a "harmony"
- in the aerosol photometry
- Stimulating the communication between operational agencies and academia, with the aim to increase the applicability of aerosol products.

- Encouraging and organizing the dialogue between researchers and instrument manufacturers, towards innovation actions on current and future photometric-aerosol instrumentation.

https://harmonia-cost.eu/

History of Identity Documentation in European Nations: Citizenship, Nationality and Migration

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Identity documentation has come to feature in every part of modern life. The History of Identity Documentation in European Nations (HIDDEN) network unites scholars in history, migration studies, geography, sociology, law, linguistics, postcolonial studies, human rights and more to look at the history of ID regimes in Europe and beyond, drawing connections between the past and present. In the context of UN Sustainable Development Goal 16.9 that everyone should have a legal identity by 2030, and the rise of new forms of biometric digital ID, such as the Covid-19 vaccination certificates, it is timely that an interdisciplinary and multidisciplinary group of scholars critically examine the antecedents of modern systems and contemporary practices which can increase societal inequalities.

ID is often linked to migration, a global challenge shaped by crises of climate, economics, pandemics, politics and war. Documents available to citizens fleeing crises is determined by place of birth, geopolitics, gender and colonial and family legacies. We take seriously the need to examine ID in the context of mobility, but extend this to an analysis of the role of ID in every day life. HIDDEN analyses how states hinder or help citizens accessing ID, the role technology plays and what ethics are involved in accessing past personal data.

HIDDEN explores issues of identity, citizenship and migration through connecting historical research on identity documents with modern, digital forms of identity documentation and the laws that create and determine them. HIDDEN will create academic and public-facing events to enhance public dialogue around ID.

https://hidden-costaction.eu/

European network for the Mechanics of Matter at the Nano-scale

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Our society urgently needs new materials with improved performance and durability in order to overcome its environmental crisis. Room for significant progress is available at the nanoscale, where all properties originate. Research at this length scale strongly intensified over the past two decades, but the knowledge remains very fragmented. As a consequence, a holistic understanding of how the nanoscale mechanical behavior gives rise to the macroscopic properties of the materials is still missing.

The Action ambitions to combine the expertise and resources of European researchers to overcome the different bottlenecks limiting the exploration of mechanical size effects. Synergetic gains will be achieved through a common agreement on the physical parameters to be measured and by promoting interoperability of the produced research data throughout the European Research Area (ERA). In addition, the experimental yield will be boosted by granting access to the latest techniques in nanomechanical testing, nanomechanical simulation and nanocharacterization to the whole community. Even more dramatic gains will be achieved by promoting the application of machine learning to nanomechanical research and favoring the development of interdisciplinary in situ techniques.

The transformative policies implemented by MecaNano will durably strengthen nanomechanical research in the ERA. They will foster the emergence of talented future scientific leaders, increase the number of female scientists engaging in nanoscience, as well as increase the visibility of research institutions in Inclusiveness Target Countries and allow their researchers to establish durable cooperations with their peers throughout the ERA.

https://mecanano.com/

PROmoting GeRiAtric Medicine IN countries where it is still eMerGing

CHAIR: Dr Marina KOTSANI (EL) marinakots@gmail.com

FUNDING PERIOD: November 2022 - November 2026

SUMMARY

Geriatric Medicine (GM), which is the field of medicine that is concerned with the health and well-being of older adults, can play a crucial role in the alignment of health systems to the needs of the constantly growing older populations. However, countries have varying GM development backgrounds.

This Action's objective is the definition of the content of targeted education and training activities in GM for health care professional across various clinical settings, destined mainly for countries where GM is still emerging and adapted to the local context, the needs and assets of stakeholders and the pragmatic possibilities of involved settings.

This will be accomplished by the description of the state-of-the-art of GM in involved countries, the identification of the global and more specific local needs regarding the development of GM-related clinical skills and competencies of medical doctors and allied healthcare professionals involved in the care of older people across all the spectrum of health care services, the definition of the content of a training course in GM destined to non-geriatricians, by adjusting international standards to local needs and pragmatic possibilities, and the dissemination of results on identified needs and proposed solutions to stakeholders, policy makers and the public. Countries with well-established GM systems will contribute with their experience and know-how in clinical and academic GM.

Pragmatic solutions that aim to address the specialized health care needs or older people, such as tailored education and training of existing workforce, are feasible, affordable and exponentially efficient, and, thus, highly relevant.

https://cost-programming.eu/

Cancer- Understanding Prevention in Intellectual Disabilities

CHAIR: Prof. John Wells (IE) jswells@wit.ie

FUNDING PERIOD: October 2022 - October 2026

SUMMARY

There is poor understanding of cancer prevention among people with intellectual disabilities. CUPID will establish a research agenda and knowledge base to improve this in the European Union and beyond. Among the European intellectual disabilities population, many cancer diagnoses are symptomatic presentations following on from behavioural distress or physical changes. Cancer deaths among this population occur up to 20 years earlier than the general population. Factors influencing unequal health status and premature death amongst people with intellectual disabilities warrant further investigation. Article 25 of the United Nations Convention on the Rights of People with Disabilities acknowledges their right to healthcare. The Council of Europe Disability Strategy 2017-2023 recognises health systems failure to engage with and include people with disabilities. Many external and internal factors influence healthcare engagement among this population resulting in long- term health consequences. External factors include diagnostic overshadowing, paternalism and cancer screening delays during the COVID-19 pandemic. For the person challenges with communication, cognitive ability and decision- making capacity influence healthcare engagement. It is timely to develop collaborative links with the EU research and service provider communities to reach consensus on addressing these challenges. CUPID establishs active working partnerships with academics, researchers, non-governmental organisations, carers, people with intellectual disabilities and policy makers. CUPID will establish a research agenda and exchange information regarding cancer prevention in the intellectual disability population. Short term scientific exchanges, training schools, conferences and seminars using a hybrid approach will explore highlighted issues. Other network funding streams will not support this kind of activity.

https://cupidproject.eu

LIFT: Lifting farm animal lives – laying the foundations for positive animal welfare

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FUNDING PERIOD: November 2022 - November 2026

SUMMARY

The COST Action 'LIFT' will provide the background for including positive welfare in farm animal welfare assessment.

The traditional approach to animal welfare was to prevent suffering and there is consequently a large bias in the science of animal welfare towards the study of negative experiences. Recent advances, however, are leading to considerations of positive experiences, also referred to as positive welfare, which is more in line with consumer and citizen expectations. There is currently no agreement among researchers on what constitutes positive animal welfare, or what kinds of techniques, tests and procedures are sound methodologies to assess positive experiences in farm animals. Consequently, no welfare assessment scheme currently includes direct animal-based indicators of positive experiences.

The Cost Action will progress this research area in a multidisciplinary scientific approach by cross-discipline knowledge sharing, training and Europe-wide collaboration to lay the foundations for this growing area of research. The main aims are to 1) define positive farm animal welfare and clarify its concepts, 2) identify valid approaches to assess positive animal welfare, and 3) select methods suitable for on-farm use and provide recommendations for the inclusion of aspects of positive welfare in farm animal welfare assessment schemes. Throughout, stakeholders responsible for welfare assurance schemes from industry, government and NGOs, as well as veterinary organisations and advisory bodies for farmers are involved to ensure practical feasibility and to improve the animal production sector's sustainability.

www.liftanimalwelfare.eu

A European forum for revitalisation of marginalised mountain areas

CHAIR: Prof. Juha Hiedanpää (FI) juha.hiedanpaa@luke.fi
FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Mountainous areas are characterized by disparity, poorer territorial cohesion, unbalanced use and conservation of ecosystem services, rich and exploited natural resources, and marginalization. MARGISTAR forum reflects collaboratively on natural, environmental, social and economic inter- relationships and interactions in mountainous areas, and identifies a range of environmental, social, economic, and political challenges. It enables innovation through a range of physical and virtual meetings to co- design innovative pathways for the transformation of marginalized mountainous areas towards their green, digital and healthy futures. It establishes an online society-science-policy platform of Fairway in Europe to stimulate the dialogue between scientists, policy makers, mountain actors, NGOs, SMEs, public bodies and private organizations and the establishment of local Knowledge and Information Systems. MARGISTAR uses task groups (TGs) to co-creatively move towards the solutions. TG 1 is responsible for coordination/networking.TG 2 critically assesses the situation and identifies viable bottom- up visions of post marginalized areas and pathways towards their revitalization. TG3 facilitates capacity building and outreach.

Key scientific impacts are anticipated by using the innovative concepts of "pinching the policy maker" and "resilience erosion". Societal and policy impacts are primarily secured by challenging business-as-usual discourses, facilitating the engagement of young and ITC researchers, and supporting agricultural, land use and rural policies. MARGISTAR uses multi-/inter-/transdisciplinary approach to support the EU's efforts for inclusive, competitive and green economies and societies and excels in knowledge exchange, co-creation and capacity building for socially just green recovery and climate mitigation and adaption for the revitalization of marginalized mountainous areas across Europe to leave no one behind.

https://margistar.eu/

Carbon molecular nanostructures in space

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The aim of NanoSpace is to determine the abundance, formation mechanisms and astrochemical role of carbonaceous nanoparticles in space. Carbon is ubiquitous in space; from small carbon and hydrocarbon molecules to fullerenes and large but currently unidentified polycyclic aromatic hydrocarbons, carbonaceous dust particles and ultimately life. The clear identification of C60 in the interstellar medium and around planetary nebulae has provided us with a tangible key to unlock the mysteries and complexities of cosmic carbon. We will exploit this opportunity through the synergistic combination of expertise from observational astronomy, laboratory astrophysics, spectroscopy, molecular reaction dynamics, theoretical chemistry, data science, synthetic chemistry, material science and astrobiology. This Action will provide a common basis for the different communities to interact and learn from each other, training a new generation of researchers with the laboratory, theoretical, observational and numerical skills to drive the field forward. The leading role of European researchers in this new field will be enhanced by integrating teams from ITC and involving and enabling early career researchers to take leading roles. The potential of current and upcoming observational satellites and large-scale user facilities will be fully exploited to understand the formation and astrochemical consequences of complex cosmic nano-carbons. NanoSpace will have a significant legacy, delivering the scientific community with a structured database containing relevant information on nano-carbons for use in future projects, providing new tools and knowledge to unravel key mysteries in astrochemistry and a new generation of interdisciplinary researchers with valuable translational skills to drive socioeconomic development.

http://research.iac.es/proyecto/nanospace/

Techno-economic analysis of carbon mitigation technologies

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

TrANsMIT proposes a COST Action on the techno-economic analysis (TEA) of the overall, integrated CO_2 Capture, Utilisation, and Storage (CCUS) value chain. It aims to bring together academia, research institutes and industry into a cutting-edge, pan-European knowledge network. The Action advances the research frontier of CCUS TEA from partially unharmonized and disciplinary research to harmonized, holistic pan-European, coordinated research on the full CCUS system, facilitating development of the most technologically, economically and commercially feasible CCUS technologies and systems. It will be achieved by harmonizing and coordinating the methods and tools used for CCUS TEA in Europe, leveraging the knowledge created by our partners in national or international research projects. The project focuses most on holistic assessment of the CCUS chain, and on those areas where most development is needed (e.g. CO_2 capture from air, CO_2 utilization). The created science will be an essential means to steer CCUS R&D and deployment in a direction that allows reaching climate targets on-time and in a cost-effective manner, while harnessing the competitiveness of European industry. TrANsMIT will have a strong focus on knowledge sharing and career development, tackling existing disparities in knowledge distribution and career opportunities. It will foster strong collaboration between the more and the less research intensive countries in Europe, improving the access of the latter to State-of-the-Art science and new research projects. It will put into leadership roles early-career researchers and minorities, helping to fast-track their career development. TrANsMIT will lead to top-tier techno-economic analysis of CCUS systems across European countries.

https://transmitccus.eu/

PROton BOron Nuclear fusion: from energy production to medical applicatiOns

CHAIR: Dr Katarzyna Batani (PL) katarzyna.batani@ifpilm.pl

FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Recent experiments with high-intensity lasers have shown record production of alpha particles by irradiating boron-hydrogen targets. This opens the way to completely new studies on pB fusion with multiple goals:

i) studies related to nuclear fusion. The proton-boron fusion reaction produces 3 a-particles and releases a large energy. It is considered an interesting alternative to deuterium-tritium fusion because it produces no neutrons, therefore no activation and radioactive wastes. However, it is also considered too difficult due to the enormous temperatures needed to trigger it. Laser-driven experiments may offer an interesting non-thermal fusion approach, alternative to classical inertial fusion schemes. In addition, it will be possible to address still unanswered key questions like determining the penetration of a-particles in dense plasmas.

ii) generation of novel laser-driven a-particle sources. Currently there are no high-current and compact a-particle sources (they are typically produced from radioactive materials or from accelerating He-ions in large-size cyclotrons). Laser-driven a-particle sources are promising due to the high brightness implied by the small size of the laser-plasma interaction point and the short particle bunch duration. Such sources could be used for multidisciplinary applications, including medical ones (e.g. radioisotope production for cancer therapy or PET).

The Action's work will aim at understanding the physics involved in the emerging topic of laser-driven pB fusion, facilitating access to experimental infrastructures, maximizing production of new knowledge and achieving breakthrough discoveries, boosting career of young researchers by fostering opportunities for training, and finally interconnecting researchers across countries building a well-organized community focused on pB research.

https://www.ca-probono.eu/

What are Opinions? Integrating Theory and Methods for Automatically Analyzing Opinionated Communication

CHAIR: Prof. Christian Baden (IL) c.baden@mail.huji.ac.il
FUNDING PERIOD: September 2022 - September 2026

SUMMARY

OPINION will establish the field of textual opinion research, a critical upgrade for the emerging field of computational communication science. For the first time bringing together researchers studying opinionated text across and beyond Europe, the Action aims to provide the much-needed conceptual grounding, methodological integration and training to significantly advance the use of computational methods for studying digital text. OPINION convenes early- and mid-career researchers from 30 European countries, Israel, Russia and the US, integrating cutting-edge expertise from different disciplines (notably, communication science, computational linguistics, IT) while networking the many, hitherto largely disconnected language communities of textual researchers. The Action will develop united conceptual foundations and research agendas, as well as versatile computational measurement strategies for the study of opinionated text, while advancing computational skills and building a community of computational textual opinion researchers. Thereby, OPINION turns the linguistic and political-cultural fragmentation of European digital discourses into a key asset toward the development of a truly multilingual, culturally sensitive field of computational text analysis. This bid comes at a critical moment, challenging the primacy of US-focused, corporate-driven, English-language computational text research, establishing a powerful counterweight of collaborative academic research and tool development committed to open science principles and inclusive training. OPINION will provide research and industry with the robust tools needed to analyze digital text; equip politicians with the perspectives needed to regulate online deliberation spaces; aid citizen initiatives in maneuvering political landscapes; and create dialogue with tech giants about the impact of the algorithmic affordances on public deliberation and democracy.

https://www.opinion-network.eu/

P2X receptors as a therapeutic opportunity

CHAIR: Prof. Elena Adinolfi (IT) elena.adinolfi@unife.it

FUNDING PERIOD: October 2022 - October 2026

SUMMARY

P2X receptors (P2XRs) are ATP-gated ion channels involved in intercellular communication with an established role in neurodegeneration, infection, inflammation, cancer growth, and progression. In vitro and in vivo evidence, generated mainly by leading Europe-based laboratories, shows that P2XRs might be an ideal pharmacological target in these diseases and many others. Over the years, highly selective agonists and antagonists have been synthesized, and therapeutic antibodies targeting the P2XRs have been raised. However, the transfer of this wealth of knowledge from research laboratories to the patients' bed has been slow, and clinical trials so far carried out have been unsatisfactory. We strongly believe that this was due to a noticeable lack of coordinated effort by basic research, clinical and industry-based investigators. The PRESTO Action aims at accelerating the transition of P2XRs knowledge to clinical applications. PRESTO will be accomplishing these goals by 1) promoting a coordinated effort by leading basic and clinical science experts and Industry-based investigators aimed at the selection of the most appropriate pathologies amenable to P2XR-targeted therapy; 2) identifying the best- suited P2XR-directed drugs to take through the clinical pipeline; 3) establishing validated experimental protocols and tools; 4) setting criteria for the validation of P2XRs as diagnostic and prognostic biomarkers; 5) promoting dedicated clinical trials; 6) training a new, multicultural, transdisciplinary, generation of young researchers skilled in the P2XR field; 7) disseminating in the scientific community, biomedical students, charities, local and national health authorities and the general public, the awareness of the importance of P2XR-based research.

https://www.p2xcost.eu/

Enabling multilingual eye-tracking data collection for human and machine language processing research

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

The MultiplEYE COST Action aims to foster an interdisciplinary network of research groups working on collecting eye tracking data from reading in many languages. The goal is to support the development of a large multilingual eye tracking corpus and enable researchers to collect data by sharing infrastructure and their knowledge between various fields, including linguistics, psychology, and computer science. This data collection can then be used to study human language processing from a psycholinguistic perspective as well as to improve and evaluate computational language processing from a machine learning perspective.

The MultiplEYE COST Action has three core goals: (1) To provide a platform for discussing the desiderata and reaching a common ground between psycholinguists and computational linguists for a multilingual eye-tracking and self-paced reading data collection. This includes developing and reaching a consensus concerning experiment design, stimulus selection, stimulus layout, experimental procedure, and data preprocessing. (2) To enable discussions on the psycholinguistic research questions that can be addressed with multilingual eye movement data and providing a broad network to initiate collaborations focusing on cross-linguistic and multilingual projects. (3) To advance the natural language processing and machine learning applications that leverage eye- tracking data and improve their cross-linguistic generalization abilities by bringing researchers from psycholinguistics and computational linguistics closer together.

https://www.multipleye.eu

European Swine Influenza Network

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FUNDING PERIOD: November 2022 - November 2026

SUMMARY

Swine influenza is a highly contagious respiratory disease in pigs caused by influenza A viruses (swIAV) which leads to production losses. The intensification of pork production systems and free livestock movement across borders fosters the spread of the virus in Europe. New variants, some with zoonotic potential, constantly emerge. Recent human pandemics have highlighted the zoonotic and reverse zoonotic potential of swine influenza and its risks for both animal and public health. Despite the burdens caused by swine influenza, surveillance across Europe is scanty and fragmented. Disease awareness is low in some European countries, diagnostic protocols are not harmonized, most countries lack standardised procedures and vaccinecoverage is inconsistent. An interdisciplinary expert network is needed to develop a comprehensive view of the disease and its impacts to better manage swine influenza in Europe. ESFLU will:

- Facilitate data sharing and analysis for swIAV surveillance with national and international agencies
- Establish the network as the European OFFLU counterpart and support global surveillance and pandemic preparedness
- Strengthen capability in Europe to detect, identify and characterize swIAV virus
- Establish guidelines for swIAV management and control in pig herds
- Promote dialog between stakeholders and inform policymakers and the general public on swine flu disease burden and the risks to public health.

ESFLU gathers 76 experts in an interdisciplinary One Health approach. The Action will advance scientific knowledge concerning swIAV, improve disease surveillance and management capabilities, benefit pork production and reduce risks to both animal and human health.

https://swineflu.eu

Globalization, Illicit Trade, Sustainability and Security

CHAIR: Dr Francesco Giumelli (NL) f.giumelli@rug.nl

FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Illicit trade affects all aspects of contemporary societies. By definition, the term "illicit" signals practices that are not permitted by law or disapproved of by society. It enables security threats to materialise, such as natural-resource-fuelled conflicts and terrorism. It presents safety hazards, such as those created by counterfeit medicines and drugs. It threatens the sustainability of our societies by consuming excessive planetary resources and undermining the regulated functioning of international markets. Yet, despite this obvious objective relevance, the discussion on illicit trade remains compartmentalized within disciplinary boundaries. It requires an interdisciplinary approach instead. The Globalization, Illicit Trade, Sustainability and Security (GLITSS) COST Action contributes to filling a research gap. Three working groups are established, focusing on the phenomena of illicit trade (the smuggling and trafficking of goods and money), the platforms behind it (norms, actors and regulations) and the responses to it (enforcement, alternative measures and legalisation). GLITSS creates an interdisciplinary research network characterised by the inclusiveness and epistemological diversity that defines the research field today. The objectives of the Action are to create a holistic research agenda on illicit trade practices, to increase public awareness with a view to enhancing societal resilience and to explore how technological innovation facilitates illicit trade, but can also be used to fight it. Governmental agencies, civil organizations and academics will benefit from a Europe-wide discussion on illicit trade. Ultimately, GLITSS will advise stakeholders on how to create a more resilient and sustainable society by identifying, understanding and countering illicit trade.

https://www.glitss.eu/

Towards zer0 Pesticide AGRIculture: European Network for sustainability

CHAIR: Dr Christian Huyghe (FR) christian.huyghe@inrae.fr
FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Current crop protection in EU agriculture is heavily reliant on chemical pesticides to suppress weeds, pests and pathogens. In view of the serious health and environmental consequences, European public authorities, consumers, and society at large are demanding drastically reduced use of chemical pesticides, in the context of a production of safe, high-quality and affordable food. Furthermore, farmers are calling for research and innovation solutions to protect crops with non-chemical means while maintaining a viable farm economy. A change of direction and paradigm is needed to foster this transition, emphasizing preventive crop protection based on agroecological practices that to prevent pest outbreaks and infestations. The proposed Cost Action T0P-AGRI-Network targets the transition "Towards zer0 Pesticide AGRIculture", aiming at preparing the future of an agriculture free of synthetic pesticides and of nature-derived pesticides that negatively impact environment and human health. T0P-AGRI-Network tackles this challenge by create and organize a wide research community with the aim to form a European leading network with high and transdisciplinary expertise around the common objective of pesticide-free agriculture, with a particular focus on young scientists. To enable a redesign of the food system as a whole, T0P-AGRI-Network will promote a concerted mobilization of scientists, farmers, processing industries, public authorities and consumers by associating them closely with the activities that will be carried out in the Cost Action.

https://wissen.julius-kuehn.de/t0p-agri/

Modelling immunotherapy response and toxicity in cancer

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FUNDING PERIOD: November 2022 - November 2026

SUMMARY

The IMMUNO-model COST Action aims to foster research and innovation in the field of preclinical immuno-oncology models with the ultimate goal of advancing in the treatment of cancer patients by improving their outcomes and quality of life.

The unprecedented change that immunotherapy has represented in the treatment of cancer is best illustrated by the spectacular results obtained in previously incurable malignancies, such as metastatic melanoma. However, the widespread use of these therapies has been hindered by their limited effectiveness and associated toxicities. A better understanding on the complex interactions between tumor cells and the immune system is strictly required to address these problems, and to develop more effective and safer immunotherapies. However, one of the most important obstacles in immuno- oncology research is the scarcity of preclinical models that faithfully recapitulate human immunity and contribute to identify novel therapeutic targets, characterize biomarkers of therapeutic response and toxicity, and generate reliable data on drug synergies.

IMMUNO-model will bring together European researchers from diverse sectors (academia, clinical, industry) with the common goal of establishing a Network that endorses immuno- oncology research by specifically promoting the sharing, standardization and application of immunotherapy preclinical models. This Action will allow the implementation of a broad, creative and collaborative hub through the organization of community-building activities, the creation of synergies among European and non-European scientists, and the training of future researchers in the field. The ultimate aim of this Action is to contribute to translate novel scientific discoveries into benefits to cancer patients and the society.

https://www.immuno-model.eu/

Addressing observational tensions in cosmology with systematics and fundamental physics

CHAIR: Prof. Jackson Levi Said (MT) jackson.said@um.edu.mt
FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Our understanding of the Universe is at a turning point with the predictions of the standard model of cosmology (or concordance model) and the observations from different surveys showing tensions in several key areas. The disagreement is expressed in the value of cosmic expansion as well as in the growth of large-scale structure in the Universe. New cosmological surveys, many of which are European, may expose tension in additional areas of the concordance model. The question of cosmological tensions can be confronted in a number of ways. Firstly, survey data needs to be further analyzed for potential systematic uncertainties or biases. It would also be interesting to explore predictions from possible combined survey data, which is something survey collaborations cannot normally explore. Secondly, there have been numerous advances in approaches to data analysis and statistical approaches, some of which provide less dependence on cosmological models to make cosmological parameter estimates. Lastly, there are a plethora of new proposals from fundamental physics which range from novel neutrino physics to dark energy proposals (and others) which may contribute to a solution to the cosmological tensions problem. These represent the three research themes through which cosmological tensions will either be alleviated or resolved.

The main aim of CosmoNET is to establish a synergy between these research areas and foster a sustainable network based on interdisciplinary research in order to confront the growing challenges of tensions in cosmological survey data. CosmoNET will take a harmonized approach involving all key communities.

https://cosmoversetensions.eu/

Ethics in Dementia

CHAIR: Dr Sigurd Mørk Rønbøl Lauridsen (DK) sila@sdu.dk

FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The main aim of the Ethics in Dementia (EDEM) COST Action is to reduce burnout and moral distress among caregivers and promote the dignity, autonomy, and quality of life of people with dementia.

Dementia is a health challenge on the rise. The overall number of people with dementia in Europe is expected to almost double from 1.57% of the population in 2018, to 3% in 2050. There is no effective treatment for any of the 200 known dementia diseases. It is not possible to halt or reverse the cognitive decline caused by dementia.

This makes care the most important health intervention for people with dementia.

However, there are profound ethical difficulties involved in caring for people with dementia. Their gradual cognitive loss complicates retainment of autonomy and agency, and causes a number of ethical care dilemmas, including: balancing safety with freedom, deciding what is in their best interests and recognising that the needs of the person with dementia may sometimes conflict with the needs of others who also deserve consideration. Legal frameworks and guidelines are helpful in guiding practice and decision-making, but they need to be interpreted and applied to specific situations.

EDEM addresses this challenge. By involving a multitude of stakeholders in developing an ethical framework, recommendations and an educational toolkit available for use across Europe, EDEM aims at improving dignity, autonomy and quality of life of people with dementia, as well as reducing burnout and moral distress among caregivers.

https://ethicsindementia.org/

Joint effects of CLimate Extremes and Atmospheric depositioN on European FORESTs

CHAIR: Dr Rossella (Maria Rosa) Guerrieri (IT)
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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The ability of forests to continue mitigating climate change depends on their ability to cope and adapt to global change drivers, such as more frequent climate extreme events and changes in atmospheric pollutants (namely carbon dioxide, reactive nitrogen and sulphur compounds). Different global change drivers could play a synergistic, antagonistic or predisposing role in affecting forest ecosystem functioning and health. All these drivers, however, are generally considered in isolation, and their effects on key processes (at tree, soil and ecosystem levels) are investigated separately in natural, periurban and urban forests, thus leading to uneven, un-coordinated and scattered information among different research communities. Without taking a holistic view on forest's responses to global change, the future trajectory of Europe's forests and their climate change mitigation potential can be fundamentally mis-assessed. CLEANFOREST will establish an inclusive and multidisciplinary pan-European network, which capitalizes on existing expertise and infrastructures (monitoring networks, manipulation experiments) to i) coordinate research efforts (e.g. data collection), ii) compare approaches and define common protocols to standardize measurements and methods used in global change studies, and iii) foster collaboration among different research groups to exchange and synthesize data, thus contributing to advancing scientific knowledge, identifying research gaps and providing suggestions for the next generation manipulation experiments and monitoring networks. Finally, CLEANFORST will benefit from the participation of key stakeholders (policymakers, small companies developing low-cost and effective instruments for environmental monitoring, citizen associations), by promoting mutual synergies to fulfil the urgent need of evidence-based solutions to policy, societal and technological challenges.

https://cleanforest.eu/

3Rs concepts to improve the quality of biomedical science

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Awareness of the existence of a reproducibility and predictability crisis in biomedical science has increased in recent years. The reproducibility crisis refers to the problem that researchers struggle to replicate or reproduce scientific studies. There has been many publications reviewing why preclinical research is irreproducible and lack of predictability, pointing this to deficiencies in reporting and statistical practices. Confounding factors, which are part of the laboratory environment and will influence both the dependent and independent variables, continue to be identified, suggesting that our knowledge of their existence is far from complete. Better statistical methodology will play a central role in improving the reproducibility of science to produce robust and reproducible research. Another area of improvement is the development of novel methods to better define and assess replication success and improve predictability. Under this light, the development and introduction of new, powerful concepts for biomedical research is essential to reduce the production of non-reproducible and non-predictive data. This has immense scientific, economic and social significance. In this context, we propose that the findings and concepts from the 3Rs field can greatly help to improve biomedical research on several levels.

Therefore, the main aim of the COST Action IMPROVE is:
To establish a network which will work to refine, harmonise and promote 3Rs concepts, data and documents, in order to improve the quality of biomedical science.

INTercEption of oRal CancEr develoPmenT

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FUNDING PERIOD: November 2022 - November 2026

SUMMARY

The INTERCEPT (INTercEption of oRal CancEr develoPmenT) Cost Action addresses the challenge of unmet oral cancer prevention and bring new paradigm to disease management of oral potentially malignant disorders (OPMD). Relying on excellent translational research, patient care and education in Europe (EU) in the field of cancer medicine, INTERCEPT will develop future strategies of personalized OPMD preventive and care approaches. Pluridisciplinary expertise will involve and target a spectrum of keys actors to ensure a long-term success. At the level of the patients' medical histories, the Action will perform disease trajectory analysis based on healthcare data. At the level of the caregivers, the Action will improve patient's pathway by developing electronic-health tools for patients' monitoring. Unbiased techniques to improve early detection of OPMD will be explored. At the level of the clinical and translational researchers, the Action will: develop preclinical models to evaluate new pharmacological approaches to cancer interception; coordinate a network of centers to work on prospective clinical trials evaluating new preventive agents; coordinate the development of standardized procedures for sample collection, and comprehensively characterize OPMD to improve patient stratification.

At the level of the citizens, the Action will study the socio-economic and ethical impacts of developing personalized preventive medicine and work with policy makers and regulatory bodies to transfer our findings into real-life application.

The network will bring together 108 participants from 23 COST countries, and will facilitate the collaborative research work between involved stakeholders and promote efficient preventive measures for all citizens across EU.

https://interceptoralcancer.com/

Grassroots of Digital Europe: from Historic to Contemporary Cultures of Creative Computing

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

In a time when academics and citizens are increasingly concerned with surveillance capitalism, Europe takes on a leadership role in the global transformation towards a digital future that treats users fairly. It fosters initiatives such as the right to repair, pushes privacy and security policies such as the GDPR, and highlights citizens' digital rights. These developments have their historical precedents in the 1980s and 1990s, when enthusiasts across Europe started to take part in grassroots culture of creative computing, or the participatory use of computers for experimentation, self-expression, or activism. Besides laying groundwork for commercial successes, these communities created important specimens of digital cultural heritage (e.g. the demoscene or seminal computer games) and universally adopted technical solutions (e.g. the Linux operating system). To successfully implement the values of participation, social inclusion, and bottom-up innovation in today's technology policy, we need to understand these historical developments. However, the historical knowledge about creative computing in Europe has so far been fragmented and lacking in transnational and interdisciplinary dialog. GRADE aims to build a robust and diverse network of researchers from across Europe who will integrate the existing knowledge and work on new transnational projects. Within its work packages, the action will focus on investigating user communities, their interaction with state and European-level policies, and the preservation of digital cultural heritage. Together, GRADE will contribute to a participatory technological agenda for Europe that is informed by historical research and sensitive to the cultural contexts of the various regions of Europe.

https://costgrade.eu/

Fruit tree Crop REsponses to Water deficit and decision support Systems applications

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Due to climate change water scarcity and increased evapotranspiration requirements are serious challenges for agriculture worldwide and are jeopardizing the future supply of many crop productions. As perennials, fruit tree crops are particularly threatened by this risk and growers need rational strategies to improve their orchards water use efficiency. This proposal aims at understanding the physiological behavior of fruit tree crops in response to drought stress, in different environments, and identifying the best tools to monitor plant water status in real time while allowing growers to precisely schedule irrigation through the adoption of new technologies. Activities will focus on 1) identifying the most useful physiological parameters to quantify drought stress using cost-effective and user-friendly sensor tools; 2) comparing and assessing the performance of existing models to quantify plant water needs under drought, for possible implementation in decision support systems (DSSs); 3) defining the most effective (deficit) irrigation strategies for different crops and environments and 4) identifying gaps for improving existing DSSs based on the knowledge generated by the network, while taking actions to facilitate their diffusion among stakeholders and adoption by end-users. Results from this Action will provide relevant information for making a step forward towards a more sustainable irrigation management of EU orchards. In cooperation with researchers, SMEs, service providers, local water authorities and fruit producers, knowledge resulting from this network activity will be disseminated to a wide spectrum of EU stakeholders and to the general public, making EU fruit production more resilient and raising awareness of the problems related to water scarcity.

https://cost-fruitcrews.eu/

Transnational Family Dynamics in Europe

CHAIR: Prof. Mieke Schrooten (BE)
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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

This Action aims to deepen the knowledge of the growing, rapidly changing phenomenon and dynamics of transnational families (TNF) by bringing together researchers and stakeholders from different disciplines and countries to address the need for transnational insights and to formulate policy and practice-oriented recommendations with an impact on international, national, sub-local and local practices. This Action will closely monitor current trends in migration, technology and politics, and engage in an intensive dialogue with policy and practitioners, and, thus, address the need to deepen and broaden scientific and policy understanding of TNF.

The Action will develop a systematic exchange of knowledge, innovative interdisciplinary and international perspectives on TNF and tangible recommendations for stakeholders and policy makers. To achieve this, the Action is structured into 4 thematic working groups (WGs), which address critical areas that are gaining importance in research, practice and policy and therefore require significant theoretical and empirical development: WG 1: Kinkeeping within TNF in a global and digital era; WG 2: Integrating the perspective of vulnerable children and young people in social welfare and policy; WG 3: Social rights and social protection of transnational families; WG 4: Health and well-being of TNF. In addition, WG 5 will stimulate methodological progress and WG 6 will consolidate the recommendations of the other 5 working groups into clear and tangible recommendations for stakeholders and policy makers.

www.transnational-families.eu

SUPERCONDUCTING NANODEVICES AND QUANTUM MATERIALS FOR COHERENT MANIPULATION

CHAIR: Dr Hermann Suderow (ES)
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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Recent years have seen a surge in superconducting quantum electronics, with rapidly rising number of promising devices and systems enabling quantum coherent manipulation and sensing. Present operating technologies use superconducting devices with a constantly increasing number and complexity of active elements. Quantum computation, for example, requires a perfect manipulation of a large number of qubits, often implemented as complex superconducting hybrid devices in arrangements manipulating quantum phase, flux or charge, among others. However, current technologies based on well-established processes face major difficulties in scaling of environment-protected superconducting qubits. Exploring novel quantum materials and phenomena is an alternative route to considerably improve superconducting devices and make a quantum leap in their stability and coherence. Addressing this goal is a huge challenge which requires going beyond presently available networks and projects. Here we propose a collaborative approach joining together efforts and groups all over Europe, structured around three pathways, (i) the synthesis and characterization of quantum materials with novel topological properties, (ii) the fabrication of sensors and devices exploiting novel superconducting functionalities, and (iii) the generation and coherent manipulation of superconducting states that can create new opportunities in superconducting quantum electronics. Using an open and inclusive approach that joins expertise and capabilities all over Europe, this project will foster collaborative efforts aiming at disruptive achievements in the field of superconductivity. The results will have impact far beyond the development of new quantum solutions for computation, including sectors such as health and energy.

https://superqumap.eu/

European Network for diagnosis and treatment of antibiotic-resistant bacterial infections

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The emergence and spread of drug-resistant bacteria is an important health and socioeconomic threat with global dimensions, having the potential to evolve as a pandemic. No drugs are available to address the disease, while diagnostic tools are poorly effective, which notably impact the treatment and survival of critically ill patients. As such, drug resistant bacteria have the potential to outbreak and spread also outside hospital settings, representing a critical risk for the global population. Current research in the field is highly fragmented and mostly monodisciplinary, thus limiting the development of innovative diagnostic and therapeutic solutions.

This COST Action will bring together industrial and academic European researchers with different skills and expertise in a multidisciplinary and concerted initiative. The Action will combine disciplines such as chemistry, physics, bioinformatics, genetics, biology, immunology, and medicine in understanding the genetic and molecular bases of bacterial drug resistance, developing innovative diagnostic tools, and delivering lead/pre-clinical candidates, antibodies, and clinical-ready repurposed drugs towards the personalized treatment of infections by drug-resistant bacteria. The further challenge of the Action is to enhance networking among European scientists and to increase the competitiveness of European research by promoting the exploitation of translational research outcomes, e.g., by the creation of novel SMEs. Finally, by knowledge creation and sharing, the Action will train a new generation of scientists skilled in the multiple aspects related to bacterial drug resistance. Career development of Early Career Investigators (ECIs) and research impulses in Inclusiveness Target Countries (ITC) will be considered as a priority in Action management.

https://eurestop.eu/

Fundamentals and applications of purple bacteria biotechnology for resource recovery from waste

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The biotechnological development of purple phototrophic bacteria (PPB) focuses on resource recovery from waste sources, contributing to a circular bioeconomy. The technology is being scaled-up. However, technological implementation faces several challenges, as: Knowledge transfer from pure to mixed cultures; Obtaining fundamental knowledge on nutrients uptake pathways; Developing mechanistic models; Steering cultures to selective and stable communities; Defining the targeted waste streams; Optimizing culture conditions based on light transfer; Optimizing downstream processing to extract products; Developing techno-economic, social and environmental life cycle assessments. A holistic and multidisciplinary approach is required to overcome these bottlenecks. The combined efforts of basic and applied scientists and technologists from the industrial sector improve this emerging technology's competitiveness in the EU, ultimately leading to technology deployment and product commercialization. PURPLEGAIN aims to create a European network to share information, facilitating technology and knowledge transfer between the academic and industrial sectors, related to PPB applications for resource recovery from organic waste sources. Resource recovery includes wastewater or organic waste, open or closed environments, in single or chain processes. The network associates fundamental-focused and applied-research groups, improving lab-scale technology optimization through mechanistic modeling. It benefits the technology transfer from applied-research groups to industry, considerably improving process design. PURPLEGAIN also aims to create a database for techno-economic, social and environmental impacts studies, which facilitates the marketability of both the PPB-based technologies and the products to extract. Some focused products are polyhydroxyalkanoates, single-cell proteins, biomass for energy, biomass as fertilizer, biohydrogen, carotenoids, terpenoids, organic acids, coenzyme Q10, and 5-aminolevulinic acid.

https://purplegain.eu/

European Network on Optimising Treatment with Therapeutic Antibodies in chronic inflammatory diseases

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FUNDING PERIOD: November 2022 - November 2026

SUMMARY

Although treatment of chronic inflammatory diseases has been revolutionised with the introduction of targeted therapies with therapeutic antibodies, a large portion of patients do not respond to treatment or they lose response over time. This is mainly attributed to suboptimal dosing, immunogenicity and interpatient variability in pharmacokinetics. To overcome the problems of suboptimal treatment, researchers have started to focus on individualised treatment optimisation strategies based on development of patient stratification tools and therapeutic drug monitoring (TDM)-guided dose adaptations based on serum drug concentrations.

A substantial improvement in patient care will be realised by implementing individualized (TDM-guided) dosing schemes of therapeutic antibodies in daily clinical practice for treatment of chronic inflammatory diseases, which will ultimately result in a more cost-effective use of these expensive drugs ("the right drug at the right dose for the right patient"). However, expertise on individualised (TDM-guided) treatment optimisation is highly fragmented in Europe, and largely limited to a few pioneering centres. Transferring knowledge and techniques to other (peripheral) centres is challenging, especially due to the need for inhouse expertise and a lack of standardisation in TDM assays. Therefore, this Action will create an interdisciplinary, pan-European Network in order to defragment and structure the scientific research in this field and to facilitate the implementation of individualised (TDM-guided) cost-effective dose optimisation of therapeutic antibodies in daily clinical practice for treatment of chronic inflammatory diseases.

http://www.enotta.eu

Research and International Networking on Emerging Inorganic Chalcogenides for Photovoltaics

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The European Green Deal directives endorse the development of new renewable energy concepts using non-toxic materials with low environmental impact and low greenhouse gas emissions. To meet this goal, RENEW-PV brings together leading and pioneering academic and industry researchers from across Europe and worldwide, targeting to pool current and stimulate further research development and deployment of emerging inorganic chalcogenide thin-film PV technologies. THE ACTION AIMS to create a research and innovation networking environment that will allow exploiting the high stability, low environmental impact, low carbon footprint, and high technological flexibility potential of emerging inorganic chalcogenide PV technologies. RENEW-PV seeks to consolidate and strengthen the emerging PV ecosystem, providing generation and exchange of knowledge, enhancing creativity and collaboration. It will deliver a portfolio of technological benchmarking to establish performance indicators defining a technological roadmap for the development of a new type of PV technology capable of producing higher power densities, and with a wider application range than traditional Si-based PV. The challenge to overcome is to bridge the knowledge gaps between different research groups focused on materials and device modeling, thin-film materials and processes development, solar cells engineering, and material and device characterization. RENEW-PV Action will promote research excellence and foster the career development of early-career researchers and doctoral students (following the gender balance principles) through networking, training, mentoring, and integration into PV research collaborations, contributing to jobs creation and re- industrialization of Europe in a low-carbon economy and green society.

https://renewpv.eu/

Reducing acrylamide exposure of consumers by a cereals supply-chain approach targeting asparagine

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Acrylamide in food is considered a potential health hazard. It may lead to increased risk of cancer. Acrylamide forms during industrial food processing and home cooking. For years, the cereals processing industry has been engaged in reducing acrylamide formation through production process optimisations and establishment of guidelines.

The 2017 EC Regulation on acrylamide sets benchmarks on acrylamide levels in food, which are considered to be either challenging or insufficient, depending on who is asked. However, if no drastic action is taken, future regulations may threaten the availability of cereals brands.

ACRYRED's challenge is to establish a multi-disciplinary research and communication network on reducing acrylamide formation, involving the entire value chain from grains to consumer products. If asparagine levels can be reduced through better breeds and farming practices, downstream acrylamide formation in cereals-based products can be reduced significantly. The urgency to resolve the problem is compounded by the fact that there is no grain of guaranteed low asparagine concentration commercially available to meet requirements for different food categories. Further, the processing industry does not have a reliable tool to measure the level of free asparagine contained in raw material. ACRYRED brings together plant breeders, the agricultural grain farming community, grain traders, European food processors, toxicologists, public regulators and consumer interest groups to establish non-GMO research requirements on asparagine formation in plants, as well as investigate new economic models that encompass the full supply chain. The Action will also elaborate new approaches to inform catering/hospitality and consumers about responsible cooking of cereal-based foods.

https://acryred.eu/

Parental Leave Policies and Social Sustainability

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

The Action aims to advance and disseminate research and knowledge about the significance of paid parental leave (PPL) for the social sustainability of societies. Our aim is to set the scene for future PPL research from the new perspective of social sustainability while making the field more coherent across disciplines and beyond academia. The main challenges are to build the network, identify and fill gaps in PPL research, develop a future-oriented and cross-disciplinary PPL terminology, and facilitate future research by closing the PPL data gap. Five Working Groups (WGs) will be established to focus on: (1) The development of a theoretical framework; (2) the identification of social inequalities through PPL policies; (3) the relevance of PPL for child development; (4) providing a future- oriented PPL terminology and (5) the expansion of PPL data.

The initial network will consist of 32 members from 22 countries. The Action is dedicated to making the network more interdisciplinary, involving more Inclusiveness Target Countries (ITC), Near Neighbour Countries (NNC) and International Partner Countries (IPCs), and attracting participation from Young Researchers. The network will actively engage in efforts to minimize the gender gap in European PPL research and also ensure timely and close collaboration with Specific Organisations relevant to PPL research and policymaking. To fill the PPL data gap, stakeholders from European survey organizations will be approached. The network will disseminate knowledge of PPL policy as a component of social sustainability for academics at all career stages as well as for stakeholders from Specific Organisations, policymakers, companies, and the broader public.

https://www.sustainability-at-leave.uni-hamburg.de/about.html

GENERATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS FROM HAPLO-SELECTED CORD BLOOD SAMPLES

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

HAPLO-iPS aims to create a collaborative network to provide a framework for hiPSC generation of hiPSC homozygous for frequent HLA haplotypes, compatible with a significant percentage of the population to be used for cell therapy clinical trials and to create a data collection system (REGISTRY) for such lines.

HAPLO-iPS will establish an European-based excellence network on hiPSC-derived cell- based medicines that not only will boost the state-of-the-art of this research field if not will also contribute to Europe worldleadership through the medical, scientific, economic, and social development of Europe and strengthening Europe's competitiveness capacities. This network includes all the relevant stakeholders: hiPSC generation/banking centres, CB banks that will supply cord blood units; manufacturing centres (GMP complying), immunology experts, chemistry and manufacturing controls, regulatory bodies, National Agencies, and ethics experts. The challenge will be approached essentially by networking with all the stakeholders involved sharing knowledge, standardizing methodology and developing an educational training programme for researchers.

HAPLO-iPS is also promoting the participation of researchers from less research-intensive countries as a significant percentage of the members are from ITC countries. ITC participants will have access to research facilities, training courses, mentoring of ITC young researchers and will participate spreading excellence and widening participation programme. Furthermore, Key leadership positions in the Action Management are reserved to COST ITC.

Overall, this proposal will pioneer new approaches that will foster the progress of a haplo- selected hiPS generation of therapeutics by the development, implementation and exploitation of a registry with all the information for the benefit of patients.

https://haplo-ips.eu/

Implementation Network Europe for Cancer Survivorship Care

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Almost one in three individuals will develop cancer during their lifetime with almost 20 million European citizens having survived cancer. After completion of chemotherapy, radiotherapy, or immunotherapy many cancer survivors experience ongoing physical, cognitive, and emotional issues and have continuing need for support and care. It is widely acknowledged across Europe that the current model of hospital based oncology care has inadequate capacity and limited time to provide follow-up that meets endorsed survivorship practice guidelines and is no longer adequate to address the chronic and complex survivorship needs of individuals and their families. The EU's Cancer Mission "aims to improve access to quality of life and survivorship support in all Member States". The main aim of this COST Action is to systematically support the sustained translation of evidence-based interventions into routine clinical practice as part of a cross boundary, systems level cancer survivorship pathway which ultimately enhances the health and wellbeing of cancer survivors. This Network will use a cross-national comparative approach to map and make preliminary models outlining the contextual factors impacting on the: implementation of cancer survivorship care and associated risk-stratified pathways of survivorship care, and use of digital/electronic health solutions. This will be completed using an implementation science lens. Key outputs of this COST Action include: a sustainable web-based platform which hosts an integrated implementation science theory-based framework and toolkit to support the multi-level implementation of evidence-based cancer survivorship care across Europe. Through this Network the capacity and capability for cancer survivorship research and practice will be enhanced.

https://www.inecancersurvivorship.com/index.html

Network for implementing multiomics approaches in atherosclerotic cardiovascular disease prevention and research

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The latest epidemiological data suggest that cardiovascular diseases (CVD) are still the leading cause of morbidity and mortality worldwide. In order to improve the CVD outcomes, we need new strategies that incorporate the complex interplay of different driving forces behind atherosclerosis pathophysiology in addition to the traditional risk factors. AtheroNET aims to consolidate and connect experts from different fields into European and international network that will focus on the use of multiple omics technologies and data integration through machine learning/artificial intelligence ML/AI approach to bring novel paradigms in prevention, diagnosis, and treatment of atherosclerotic cardiovascular disease (ASCVD). Current CVDrelated initiatives and networks are focused on specific aspects of CVD and/or specific methodologies. AtheroNET offers a comprehensive environment in which different stakeholders (basic scientists, clinicians, bioinformaticians, industry representatives, patients' representatives) will address current challenges by: Organizing multi-centric studies for cross-validation of different genomic, transcriptomic, proteomic, and metabolomics traits related to atherosclerosis; Fostering joined research efforts through different European funds to investigate novel pathophysiological mechanisms, prognostic, diagnostic, and therapeutic ASCVD targets; Inter-sectorial cooperation with the private sector to commercialize novel scientific achievements and secure their delivery to the market; Organizing inter-laboratory dialogs and ring trials leading to standardization and harmonization of different wet-lab and dry-lab workflows; Utilizing specific ML/AI algorithms for data integration and design of innovative multiomics models.

Through the abovementioned steps, the Action will train the next generation of scientists ready to tackle upcoming challenges and provide opportunities for the transfer of novel omics technologies from bench to the bedside.

https://atheronet.eu/

Translational control in Cancer European Network

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The TRANSLACORE Europe Action will bridge disciplines and expertise across Europe in order to advance an emerging field in cancer biology: translational control in cancer. It will provide a unique opportunity to understand this biological process leading to reconsider our view of gene expression control in this disease and deliver novel therapeutic opportunities.

Translational control plays a major role in numerous physiological processes by defining the proteome, maintaining cell homeostasis, and controlling cell fate (stemness, proliferation, growth, differentiation). Acquisition of alterations resulting in translational reprogramming provides novel mechanisms by which aberrant cells escape normal physiology and favor development of cancers.

Therefore, translational control has the potential to provide innovative strategies and therapeutic avenues improving the management and health outcomes for patients with cancer. However, there is a lack of mechanistic detail to describe translational control and its contribution to the disease processes. TRANSLACORE Europe will consist of a consortium of universities, international research institutes, basic scientists, clinicians, Biotech, Pharma companies and patient associations that provides cutting edge infrastructure and world-class learning environment for broad high-quality education in various research disciplines. By implementing collaborative and cross-disciplinary partnerships, resource pooling and knowledge sharing, this structural framework aims at achieving breakthroughs allowing to accelerate secure robust transfer of academic findings to improve human health of patients with cancer. TRANSLACORE Europe will help to improve cancer management and to maintain a competitive environment for European research in the field of protein synthesis control.

https://translacore.eu/

Advanced Composites under HIgh STRAin raTEs loading: a route to certification-by-analysis

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Climate change challenges have driven an ever-increasing use of composite materials, including hybrid and metamaterials, in structures prone to extreme dynamic events. HISTRATE aims to lay the scientific and technological foundations for the creation and implementation of a robust framework for the certification-by-analysis of advanced composite structures subject to high strain rate loading, e.g., impact and blast. A paradigm shift in simulation comprehensiveness, high strain rate testing protocols and smart sensing tools is needed to replace the complex, laborious building block approach for validation and product certification with approaches based on simulations which require less tests. In this way, composition and performance adjustments should be allowed without recertification.

Realisation of this aim heavily relies on knowledge available within the HISTRATE network, which now gathers 80 European and non-European, academic and industrial experts active in the wide field of composites. HISTRATE will strongly encourage interaction between the partners by stimulating the exchange and cross-fertilisation of knowledge both across industrial sectors and expertise fields, including material and component testing, measurement and monitoring techniques, modelling methodologies, standardisation and certification. By combining the available knowledge on high strain rate response at different length scales, i.e., from the material constituents to the structure, HISTRATE will radically transform the way we discover, develop, and design ultra-high-performance, durable, safe, sustainable, and novel advanced composites for use in real high strain rate loading applications. The participation of leading actors in the field provides the basis and impetus for the adaptation of this new approach in industry.

www.histrate.eu

European network for FOstering Large-scale ImplementAtion of energy GEostructure

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Energy geostructures are a special type of ground heat exchanger installed within ground contact structures, such as retaining walls, piles, tunnels and other buried infrastructure. Thy are a relatively mature technology whose physical behaviour has been studied, including at a number or pilot sites.

However, both technical and non-technical barriers still prevent actual implementation at a large scale. This applies both in terms of quantities and in geographical reach. Some of the challenges may be related to:

Integration issues, including of shallow geothermal energy with other renewables, and of energy geostructures with other shallow geothermal sources.

Upscaling from the mastering of individual structures to the planning of geothermal district heating and the connection with the city scale.

Sustainability in the long term in terms of Environmental Impact Assessment and knowledge of the long term energy performance.

The absence of a database of knowledge regarding existing energy geostructures, their implementation, characteristics and performance.

Retrofitting of existing buildings and/or existing geostructures.

Non technical issues related to legislation, financial incentives, social impact, lack of standardization or under-developed skills in the workforce.

In addition, the full potential of this technology is not explored and some opportunities still have to be investigated. Among them are the waste heat storage or the balance of energy loads at district scale.

The aim of this COST Action is to gather all needed information to reduce these barriers and foster development by creating a multi-disciplinary network between the different stakeholders (local authorities, communities, developers, designers, academics, contractors, ...).

https://www.ca-foliage.eu/

European Network for Innovative Woody Plant Cloning

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

In vitro culture of woody plants is leaving the academic laboratories and is now being developed in a range of commercial applications in horticulture and forestry that respond to the challenges of climate change and changing global food and wood consumption habits. It is therefore urgent that the research challenges, public acceptance, risk assessment and commercial application are confronted now in order to establish a well informed scientific community, policy makers and market place. This proposal concerns the following challenges, whose solution will have a significant scientific, social and economic impact: How can we overcome recalcitrance in a lot of woody plants? What are the best tools for diagnosis, sanitation and storing clean stocks? How can the production of elite clones be scaled up at a acceptable price? What are the real risks of this technology and how can the public be informed so that they appreciate and accept the applications? How can foresters and landowners be persuaded to invest in planting poly- clonal forests? Taking these aspects into account, it seems more than urgent to us to set up a European network to connect the researchers involved from various domains, so that they can share innovations and develop new research strategies, assess the risks of the technology and improve communication with stakeholders and the general public.

http://www.copytree.eu

Enhancing Small-Medium IsLands resilience by securing the sustainability of Ecosystem Services

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

European islands are hotspots of biological and cultural diversity, which, compared to mainland, are more vulnerable to climate change, tourism development, uncontrolled land use changes and financial crisis. These factors have increasingly resulted in severe impacts on socio-economic and environmental services. Projected climate and land use change will impact on islands' biodiversity but also on ecosystem services and in turn on the quality of life of island inhabitants. Even if the existing techniques can adequately predict climate-induced ecological changes of the larger islands, this is not the case for small and medium size islands where there is a need for refinement.

Although ecosystem services (ES) assessments have been carried out worldwide in different geographical areas, islands are still underrepresented. Despite the islands's importance and vulnerability, efforts to date have focused solely on the pressures they face. Still we know little about ES supplies, flows and demands and their spatio-temporal variability, whilst integrated approaches that consider ES cross island realms (terrestrial, marine and their interface) remain scarce. Moreover, the current conceptual approaches guiding ES mapping and assessment need further refinement to account for the complex manifestations of nature and culture arising from peoples' interaction with island spaces.

The aim of this action is to provide a platform for coordinated interdisciplinary research on several aspects of mapping and assessment of ES in small and medium European Islands in order to synthesize and strengthen the knowledge base for conservation of island realms and contribute to their sustainable development.

https://www.cost-smiles.eu/

Understanding interaction light - biological surfaces: possibility for new electronic materials and devices

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Various biological surfaces are known to be covered by elaborated micro- and nano- structures, serving a number of functions (e.g. anti-reflective, structural coloration, anti- fouling, pro- or anti-adhesive, etc.) and inspiring numerous industrial applications. Recent years have witnessed a remarkable boost in research in this field. To a large extent, this boost owes to the increasing interdisciplinary of approaches being applied to the study of structured biosurfaces. Sciences as different as classical zoology and botany are inseminated with the advances in genetics and molecular biology; biologists collaborate more and more with nanotechnologists, materials scientists and engineers – all these contribute to the widening of the horizons of research on micro- and nano-structured biological surfaces, and to biomimetic and bioengineering applications of these surfaces in industry. We aim at 'riding the wave' of these developments with our proposal. The main goal of the COST Action "Understanding interaction light – biological surfaces: possibility for new electronic materials and devices" is to bring together scientists coming from distinct disciplines into this vibrant field of research, focusing on the photonic effects of nano-and micro-structuring of biological surfaces and their bionic applications. Our consortium will ensure cross-inspiration among the different participants coming from different research fields and will boost innovation in research and eventual industrial developments.

https://lightbiosurface.com/

Non-globular proteins in the era of Machine Learning

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Protein structure prediction has long been considered the "Holy Grail" of structural biology. The recent success of AlphaFold has ushered in a new era of highly accurate structure prediction, bringing to light the secrets hidden in the three-dimensional structures of globular proteins, increasing our understanding about their structural features and molecular function. However, a large proportion of the proteomes from all domains of life are rich in sequences that do not fold into regular structures, commonly known as non- globular proteins (NGPs). NGPs comprise intrinsically disordered regions, repeats, low- complexity sequences, aggregation-prone and phase-separating sequences, and are implicated in a range of age-related diseases. Their heterogeneous structural states and low sequence complexity challenge current experimental structure determination techniques and machine learning (ML) methods for structure prediction, making the molecular understanding of their sequence-structure-dynamics-function relationship difficult. The recent improvements of ML approaches and advances in determining NGP structural ensembles call for a timely re-assessment of the interplay between experiments and computation. The ML4NGP Action aims to establish an interdisciplinary pan-European network to favour this interplay, fostering experimental frameworks designed to provide information to computational methods, and novel computational methods developed, trained and benchmarked with experimental data. ML4NGP will enhance the primary experimental data generation (WG1), promote integrative structural biology approaches (WG2), benchmark the state-of-the-art ML methods (WG3) and improve the functional characterization of NGPs (WG4). The Action will support its scientific objectives through policies that sustain free knowledge exchange, inclusiveness and training of young researchers who will lead future innovations in this field.

https://ml4ngp.eu/

A new ecosystem of early music studies

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Early music, in all its breadth, and all its experimental dimensions, has been foundational to musicology as an academic discipline, and continues to play, in changing configurations, an essential role in the training courses and research programmes of musicologists. EarlyMuse aims to take this academic and artistic movement in new directions in both research and training by strengthening collaborative practices between all the stakeholders. Rethinking the scientific and experimental field, as well as the material and symbolic value of early music and its modes of promotion in the digital age and in the post-pandemic period, offers tremendous opportunities to revalorize a major part of European musical heritage. In order to address these challenges in all their complexity and diversity, the consortium brings together academic partners from 23 countries, with a network of music culture professionals and an industrial partner. EarlyMuse intends to chart new paths that will strengthen the unique place of early music in Europe, both in our intellectual and cultural practices and in its global appeal. Specifically, EarlyMuse will address six challenges: (1) scientific, (2) educational, (3) professional, (4) structural, (5) economic and (6) societal. The project will transform the scientific field, redraw the place of early music in higher education, attract original talent, deploy tools useful to emerging creative industries, and define public policy in the field of culture.

https://earlymuse.eu/

Establishing a Pan-European Network on Computational Redesign of Enzymes

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Enzymes are essential for life, enabling the required biological chemistry to occur. Owing to their unparalleled chemical and eco-friendly properties, enzymes are also industrially relevant. For example, enzymes are applied in food and pharma, while they are also included in laundry detergents. Despite their staggering chemical potential, the industrial use of enzymes is lagging behind. This is mainly because enzymes do not tolerate the conditions of their potential applications. To exploit their industrial use, enzymes have to be improved to withstand these process conditions often with additional tuning of their activity. This is typically accomplished by directed-evolution, which is laborious because it requires the experimental screening of massive mutant libraries to find the desired variants. This has been addressed by the development of computational enzyme engineering tools that show great promise by harnessing the power of a computer to create and screen large virtual libraries or to predict beneficial mutations. This dramatically speeds up and improves the efficiency of a protein redesign campaign. The COZYME (COmputationally assisted design of enZYMEs) Action comprises a Pan-European collaborative network aimed at developing and implementing state-of-the-art computational tools for rapid enzyme improvement. This will solve a key bottleneck in biotechnology: the exploitation of industrially relevant enzymes. Specifically, the Action focuses on three issues:

1. Improvement of generic enzyme properties such as stability and solubility;
2. Optimization of catalytic properties e.g. activity and stereoselectivity;
3. Advancement of experimental approaches to generate and evaluate computational predictions;
4. Train young researchers in developing and utilizing computational tools.

https://cozyme.eu/

Text, functional and other high-dimensional data in econometrics: New models, methods, applications

CHAIR: Prof. Ana Colubi (CY) colubi@uniovi.es

FUNDING PERIOD: October 2022 - October 2026

SUMMARY

This Action will integrate cutting-edge analytic developments involving innovative sources of information, such as text, functions, perceptions or imprecise data, in econometrics. High-dimensional, complex and unstructured economic datasets cannot be fully exploited hitherto by the existing methodologies. An international network of experts, spanning the disciplines of econometrics, mathematics, statistics and computer science, will be created, with the aim of establishing and implementing new efficient inferential procedures for using such information in econometric modelling and forecasting. User-friendly and freely available software will be produced. These results will enable applied econometricians to mine textual information gathered from newspapers, articles, opinions and sentiments recorded by poles, in combination with other complex and traditional data. New techniques for analyzing the evolution of economic indicators will help to improve forecasting.

Valuable insights into economic issues will provide ample prospects for further research, as vast sources of data are still noticeably under-exploited. The potential to enhance economic data analysis will be fostered by a training programme for Early Career Investigators, and by intensifying connections among academics, stakeholders, and policy- makers. The impact will not be limited to economics and finance. The interaction with experts in other areas, such as environmental sciences or health, will facilitate the transfer of knowledge and technology. Emphasis will be given to sensor data and indicators that will alert to the vulnerability of commercial enterprises and social groups to extreme events associated with environmental hazards. Such indicators will include those relating to mortality risks.

http://www.hitecaction.org/

TowArDs an improVement in diAgNostiCs and trEatment strategies for TB control

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Tuberculosis (TB) has been the leading cause of mortality from an infectious disease globally before Coronavirus Disease 19. The unprecedented pandemic is a major setback for TB programs and its impact has been tremendous in terms of disruption of timely diagnostic and intervention services, drop in notification numbers, treatment interruptions, inadequate patient's treatment follow-up and increase in mortality. In order to mitigate this impact more efforts and resources have to be allocated. Currently, no COST Action exists to address the complexity of TB management, offering an advantage to this proposal. The ADVANCE-TB is a research network that offers opportunities for collaboration between clinicians, academic researchers from interdisciplinary backgrounds, industry and non- governmental organizations to achieve breakthroughs difficult to obtain by individual partners, allowing a better understanding of the underlying host-pathogen mechanisms, enabling the transfer of basic science into innovative applications and allowing product development and clinical validation. The Action focus on 1).developing best clinical practices and experimental standardization protocols, including harmonized biobanking procedures; 2).stimulating the development and optimization of products for diagnostic and therapy/monitoring; 3).disseminate knowledge and allow capacity-building through different types of workshops, training schools and short-term scientific missions, prioritizing early career investigators. The tasks are distributed in 4 working groups (WG). Briefly, WG1 will be focused on the characterization of patient's cohorts, WG2 will be devoted to the development and evaluation of novel diagnostic methods, WG3 will be centred on the design of novel therapeutical strategies and WG4 will be responsible for dissemination and communication activities.

http://www.advancetb.eu/

Personalized medicine in chronic kidney disease: improved outcome based on Big Data

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

The scientific aim of PerMediK is to support the development of a path towards personalized medicine in chronic kidney disease (CKD), based on multidimensional -omics data (Big Data). This field is mature enough (through the existence of ample molecular data, promising therapeutic targets, and markers) to move to the next step of clinical implementation, however, this is stalled by communication gaps, lack of proper multi- disciplinary interactions, and maintenance of isolated rather than coordinated activities. This Action provides the urgently needed multi-disciplinary communication/dissemination platform bringing together a collation of pan-European expertise, representing diverse scientific fields (nephrology, several –omics areas, bioinformatics, biomarker and drug development), origin (academia, industry, links to policymakers and patient groups) and career levels. It will base upon developments and findings of several previous and ongoing European research initiatives, allowing maximal use of existing resources and coordinating activities on all critical aspects of CKD personalized medicine (from the selection and validation of CKD relevant datasets and algorithms to establishing their translational value). The expected impact includes accelerating the introduction of new technologies and therapies for the benefit of CKD patients, hence tackling a major global health problem, guidance for future research in personalized medicine, boosting innovation and European capacities. Even more: educating Early Career Investigators in the exponentially growing area of precision medicine and through the PerMediK 'inclusive' mindset, disseminating know-how and tools from centres of excellence to researchers and geographical areas with no regular access to such capacities, promoting European research as a whole.

http://www.permedik.eu

Social Sciences and Humanities for Transformation and Climate Resilience

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

SHiFT proposes the creation of a transdisciplinary Hub to address existing challenges in advancing timely societal transformations in the face of climate change. It includes the delivery of a plan of action-focused missions, initiatives, and digital content creation. The Hub comprises a core group of SSH transdisciplinary researchers and practitioners and their extended networks with a focus on unfolding the benefits of engaging with transformation in practice ideas across different social, political, economic, environmental, and technological contexts. Recognising from the onset that these categories have blurred demarcations in practice and exploring the nexus between these and their impact on different systems and regimes. The SHiFT Hub will focus on:

- Knowledge exchange and shared learning about 'critical practice', achieved by identifying and engaging with 'real-world' problem-solving that promote flexible, adaptive, multi-scalar and multiple time-frame terminologies drawing from learning by doing in action approaches, tacit and experiential knowledge and hybridizations;
- Expanding networks and cooperation through inclusive, cross-sectoral, cross- disciplinary, and contextual exchange. It will leverage various social planes from offline and online environments, to contribute and draw from existing collaborative platforms, as well as tuning in and widening climate action networks to explore critical exchange dialogues and partnerships;
- Improve transfer capabilities by leveraging best practices in online and offline communication, engagement, and co-creation with and through art and society to enhance knowledge sharing, and embodied experience in teaching and learning. Promote further transfer value through the identification of collaborative working tools and creative processes.

https://shift-cost.eu/

Universality, diversity and idiosyncrasy in language technology

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FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Efficient access to the constantly growing quantities of data, especially of language data, largely relies on advances in data science. This domain includes natural language processing (NLP), which is currently booming, to the benefit of many end users. However, this optimization-based technological progress poses an important challenge: accounting for and fostering language diversity. The UniDive Action takes two original stands on this challenge. Firstly, it aims at embracing both inter- and intra-language diversity, i.e. a diversity understood both in terms of the differences among the existing languages and of the variety of linguistic phenomena exhibited within a language. Secondly, UniDive does not assume that linguistic diversity is to be protected against technological progress but strives for both of these aims jointly, to their mutual benefit. Its approach is to: (i) pursue NLP-applicable universality of terminologies and methodologies, (ii) quantify inter- and intra-linguistic diversity, (iii) boost and coordinate universality- and diversity-driven development of language resources and tools. UniDive builds upon previous experience of European networks which provided a proof of concept for language modelling and processing, unified across many languages but preserving their diversity. The main benefits of the action will include, on the theoretical side, a better understanding of language universals, and on the practical side, language resources and tools covering, in a unified framework, a bigger variety of language phenomena in a large number of languages, including low-resourced and endangered ones.

https://unidive.lisn.upsaclay.fr/

Improving outcome of Juvenile Inflammatory Rheumatism via universally applicable clinical practice strategies

CHAIR: Prof. Michaël Hofer (CH) michael.hofer@jircohorte.ch
FUNDING PERIOD: September 2022 - September 2026

SUMMARY

Juvenile Inflammatory Rheumatism (JIR) is a family of rare and mostly lifelong diseases. Many affected patients will need long-term medication, develop significant morbidity and have an increased risk of dying at young age. Although evidence or consensus-based recommendations for diagnosis and treatment exist, they are difficult to implement in a real- life setting due to the variety of medical systems and financial capabilities. Additionally, physicians in many countries lack sufficient training in recognizing and treating these rare diseases in childhood.

The Action will collect diagnostic procedures, treatment plans and outcome measures applied in patients with 5 selected JIR-conditions herewith providing a picture of the current care provided internationally. Next, the Action members will develop consensus clinical practice strategies that are universally applicable and will guarantee the children with JIR to be offered the optimal treatment available in their country. Detailed clinical outcome data of these patients will be recorded in registries provided by the network. These outcomes will then be used to improve the treatment plans and initiate innovative research studies via 'plan-do-check-act' cycles as a continuous process.

The results of the Action will be disseminated at the end of every cycle inside and outside of the network. We will develop an international network of medical specialists and organize the training for the physician taking care of these patients. We also aim to force strategic decisions, regarding clinical care and licensing of specific immunosuppressive medication, from health authorities. This will improve the outcome of children with Juvenile Inflammatory Rheumatism worldwide.

https://www.jircohorte.org/clips

Information, Coding and Biological Function: the Dynamics of Life

CHAIR: Dr Diego Luis Gonzalez (IT) gonzalez@bo.imm.cnr.it
FUNDING PERIOD: September 2022 - September 2026

SUMMARY

In the mid-twentieth century two new scientific disciplines emerged forcefully: molecular biology and information-communication theory. At the beginning cross-fertilization was so deep that the term genetic code was universally accepted for describing the meaning of triplets of mRNA (codons) as amino acids.

However, today, such synergy has not take advantage of the vertiginous advances in the two disciplines and presents more challenges than answers. These challenges are not only of great theoretical relevance but also represent unavoidable milestones for next generation biology: from personalized genetic therapy and diagnosis, to artificial life, to the production of biologically active proteins. Moreover, the matter is intimately connected to a paradigm shift needed in theoretical biology, pioneered long time ago in Europe, and that requires combined contributions from disciplines well outside the biological realm. The use of information as a conceptual metaphor needs to be turned into quantitative and predictive models that can be tested empirically and integrated in a unified view. The successful achievement of these tasks requires a wide multidisciplinary approach, and Europe is uniquely placed to construct a world leading network to address such an endeavour. The aim of this Action is to connect involved research groups throughout Europe into a strong network that promotes innovative and high-impact multi and inter-disciplinary research and, at the same time, to develop a strong dissemination activity aimed at breaking the communication barriers between disciplines, at forming young researchers, and at bringing the field closer to a broad general audience.

https://www.dynalife.eu/

Prevention, anticipation and mitigation of tick-borne disease risk applying the DAMA protocol

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FUNDING PERIOD: October 2022 - October 2026

SUMMARY

Emerging infectious diseases (EIDs) represent a national security threat for every country, exacerbated by climate change, human population expansion, urbanization, and globalization. Based on theoretical expectations previously EIDs were thought to be rare and impossible to anticipate because they require novel genetic mutations to infect novel hosts. A new conceptual framework has been developing for nearly 40 years and has recently been articulated in a manner that leads directly to a protocol for taking proactive or anticipatory steps in coping with EIDs, especially those numerous high probability/low impact pathogens. The framework is called the Stockholm paradigm, which shows that a major trigger of emerging disease, now and in the past, has been climate change. The PRAGMATICK COST action aims to disseminate knowledge and promote the application of the Stockholm paradigm in order to anticipate and mitigate disease risk associated with the presence and spread of ticks and tick-borne pathogens (TBPs) under anthropogenic pressure and changing climate. Our research network will apply the comprehensive and highly focused DAMA (Document, Assess, Monitor, Act) protocol that allows us to "anticipate to mitigate" emerging diseases. The main focus is on urban tick and TBP hotspots and the spread and establishment of ticks and TBPs. PRAGMATICK will find new ticks and tick-borne pathogens before they find us. By applying citizen scientists and supporting capacity building in the domain tick and tick-borne disease prevention, the Action will eventually lead to new and improved insights in the potential threats related to this important group of vectors across Europe.

https://pragmatick-action.eu/

COST Actions starting in 2021
(and finishing in 2025)

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CA20101		■					163
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CA20106	■			■			168
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CA20110	■						172
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CA20112					■		174
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CA20115					■		177
CA20116	■	■					178
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CA20119			■				181
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COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA20121			■				183
CA20122	■		■				184
CA20123					■		185
CA20124	■	■	■				186
CA20125	■			■			187
CA20126		■					188
CA20127		■					189
CA20128		■	■	■			190
CA20129	■		■				191
CA20130	■	■					192
CA20131					■		193
CA20132	■	■		■			194
CA20133		■					195
CA20134					■	■	196
CA20135	■		■				197
CA20136	■	■					198
CA20137					■		199
CA20138	■	■		■	■		200
CA20139		■					201
CA20140	■						202

Plastics monitoRIng detectiOn RemedIaTion recoverY

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The "Plastics monitoRIng detectiOn RemedIaTion recoverY – PRIORITY" Action aims to develop a research network focused on developing, implementing, and consolidating strategies to tackle the global challenge of micro- and nano-plastics environmental pollution. The Action will create a broad and skilled transdisciplinary network to establish a 360-degree view combining the partners' expertise in chemistry, physics, life science, engineering, standards, economy, and law. This network will maximize the European competitiveness in creating a robust infrastructure for scientific communication, exchange, and collaboration to foster new research activities and citizen science. PRIORITY aims to enhance the technical standards for sampling and analysis of micro and nanoplastics in the environment, to develop a more reliable assessment of exposure and biological effects, and to advance activities in terms of remediation and recovery of the environment. The scientific community, economy and all the European citizens will benefit from the outcomes of the activities. One of the targets is the harmonization of the European regulation associated with microplastics related issues. The Action will then support European Commission regulations organisms in critical aspects of environmental and ecosystems protection, food safety, and life science.

https://ca-priority.eu/

Marine Animal Forest of the world

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Major marine biodiversity hotspots occur within and around extended three-dimensional communities known as Marine Animal Forests (MAFs). MAFs are biotic assemblages mainly composed of suspension-feeding organisms like sponges, gorgonians, hard corals, bryozoans, bivalves, etc., that form erect canopies like the trees or shrubs on land, thus creating underwater forests. As Aichi targets have been impossible to achieve by 2020, we need networks that allow working together for the same objective, with special attention to marine ecosystems as the MAFs. These submersed forests provide ecosystem services which are essential for hundreds of million people worldwide. In this UN decade of the oceans we aim to provide the scientific basis for understanding and preserving the ecosystem services of the MAFs throughout the world. These ecosystem services are under increasing anthropogenic pressure and need a clear unifying picture to be shared with stakeholders and public. Developing a common protocol and gathering a consensus on the most appropriate tools to study and understand the animal forests' role will ultimately inform management, restoration and conservation initiatives. The network aims to develop an integrative vision that will fuel research and steer future policies on crosscutting sustainability-driven issues related to the fragmented governance of these benthic ecosystems in coastal and open ocean waters, creating cross-sectoral platform for partners across academia, policymaking and civil society, offering inclusive spaces for a transdisciplinary dialogue. We will also unify the protocols for restoration of the MAFs of the World, with nature-based solutions, to face climate change, natural disasters, and food supply.

https://maf-world.eu/

Biosecurity Enhanced Through Training Evaluation and Raising Awareness

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Biosecurity is of paramount importance to prevent the introduction and spread of pathogens and, consequently, to preserve the health of farmed animals. Healthier animals result in better animal welfare, better sustainability of animal production systems and less antimicrobial use. Despite these benefits, biosecurity is limited by different factors: i) lack of knowledge on ways for improvement, especially in extensive systems or settings with low resources; ii) shortage of adequate ways to enhance communication; iii) diversity of methodologies to assess and measure the implementation of biosecurity measures and their cost-effectiveness and iv) low number of trained professionals. To approach these challenges, the Action will evaluate how biosecurity is currently used and will use participative approaches to understand motivators and barriers for biosecurity implementation. Knowledge generated through them will act as the baseline upon which to develop adequate communication and training on biosecurity. The Action will also perform a comparison of existing methods used to evaluate biosecurity. Exploiting these tools will promote the development of tailored options in farms based on the evaluation of their risks, on the feasibility of selected biosecurity measures and on their economic benefits. Moreover, the Action will identify training needs through the evaluation of existing training materials and will develop new courses, increasing therefore the number of trained professionals. Finally, the Action will recommend priority research areas for future biosecurity improvement in animal production systems. The Action objectives will be achieved through a transdisciplinary group where Early Career Investigators will play a key role in their attainment.

https://better-biosecurity.eu/

Network on evidence-based physical activity in old age

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Sedentary lifestyle in old age is associated with increased risk of chronic and disabling diseases, premature mortality, and substantial economic burden for society. Increase in physical activity (PA), on the other hand, may compensate the negative effect of ageing and reduce the inactivity costs. However, not all exercise regimens are universally effective, and Inter-individual differences in responses to exercise training exist. Therefore, there is an urgent need for creating "tailored" exercise programs that will fit the specific needs of the various and diverse ageing populations. A critical step towards this goal is embracing an evidence-based medicine (EBM) approach where conceptual challenges and pitfalls in basic research and clinical research on ageing and physical activity could be identified and addressed. Unmet needs and gaps in research and practice that currently hinder successful implementation of EBM for training of older adults are: 1) Lack of consolidated research information needed for designing optimal, feasible and effective exercise programs for various target groups; 2) exclusion of disabled, low income and isolated older adults both research trials and exercise interventions; 3) Lack of real-world conditions studies over long periods and 4) Limited use of technological innovations for assessing, applying and enhancing exercise programs in old populations. The main aim of the COST Action PhysAgeNet is to establish a network that will foster evidence-based research and practice of physical activity in old age and will enhance integration of innovative technological solutions in order to promote health and reduce the burden of inactivity in ageing populations globally.

https://physagenet.eu/

Slow Memory: Transformative Practices for Times of Uneven and Accelerating Change

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

We are living in times of deep contradictions. While our world accelerates and grows smaller through superfast digital networks, it is also marked by widening socio-economic disparities. We face viral pandemics, rapid species extinction, increased automation of work, quick fixes for mental health, political upheavals and displacements of old certainties. Adaptation and resilience to these challenges must draw on past experiences and cultural resources – this can only happen if we slow down and take time to remember well. This Action addresses the need for increased interdisciplinarity in our understanding of how societies confront their past to contend with environmental, economic and social changes brought on by sudden events and by slow and creeping transformations. The future of peace, prosperity, politics, work and climate will depend upon how we remember socio-cultural and political changes. Transformative practices of remembrance – as objects of study and as critical interventions – will be shared collaboratively across Arts and Sciences in order to reveal the ways in which humans confront large-scale processes of change. This Action will uniquely focus the attention of scholars, policymakers and cultural professionals on alternative paths to build resilience in the face of contemporary rapid-response culture. Through transnational and interdisciplinary discussions, we will address urgency, emergency, crisis and acceleration by drawing together the 'multi-sited', 'eventless' and slow-moving phenomena that can best be studied by 'slowing down' our research methods, to afford capacity building, knowledge generation and impact activities. Inspired by 'slow science' (Stengers 2018), we seek an alternative kind of social remembering.

https://www.slowmemory.eu

Tomorrow's 'wheat of the sea': Ulva, a model for an innovative mariculture

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

A growing interest in the development of oceanic coastal shores has arisen over the past decade, seeking alternative sustainable food sources and other valuable products. Our initiative aims at exploiting the potential of marine seaweeds in Europe. Building on the successes of previous EU and pan-European projects on seaweeds, and due the unique characteristics of the genus Ulva (Linnaeus, 1753), we have identified these green algae as the most suitable candidate and model organism for a novel kind of European mariculture. Much of the knowledge on Ulva, generated in diverse scientific disciplines and different communities, is not easily comparable nor is it shared among scientists, stakeholders, end users and the public. This COST Action proposes an innovative conceptual pathway to address these issues, significantly improving knowledge in the biology of the most promising Ulva spp., capitalising on their economic potential, and exploring commercial applications in the human food, animal feed, pharmaceutical industries and ecosystem service. The COST Action combines interdisciplinary approaches to the sustainable use of marine resources, encompassing all the facets of Ulva biology, ecology, aquaculture, engineering, economic and social sciences. This Action will lead to the development of advanced science, create business and job opportunities in the maritime and coastal economies, and have a significant impact on societal welfare. This COST Action fulfils the current 'Societal Challenges Priorities' of European Horizon 2020 strategy for food security, and its application will contribute to the UN Sustainable Development Goals 14 (UNSDG) to conserve and sustainably exploit natural resources.

https://seawheatcost.haifa.ac.il/

Connecting Theory and Practical Issues of Migration and Religious Diversity

CHAIR: Dr Milda Alisauskiene (LT)
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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

"Connecting Theory and Practical Issues of Migration and Religious Diversity" (COREnet) is an interdisciplinary network that aims at knowledge production, knowledge exchange and capacity building across Europe in the intersection of migration and religious diversity with a particular emphasis on bottom-up research. The background of the network is the pressing social situation that is characterised by the fact that migrants and Syrian war refugees coming to Europe, have become one of the major political issues and social challenges during the past years. Research, capacity building and exchange are important tools to analyse what lies behind these challenges and possible solutions. The network aims thus to contribute to overcoming divisions within and across European countries with the help of innovative approach that would add to existing social scientific knowledge on migration and religious diversity the study of religions and theological insights explaining the narratives of migrants and refugees. Drawing in researchers from all stages of their careers, and across different European countries, training a new generation of interdisciplinary action researchers capable of connecting study of religions and theology and the social sciences, and working that into action through processes of co-production. This network brings the bridging of knowledge with stakeholders – governmental, non-governmental and media organizations working in the field of diversity management on the local and national levels.

https://corenetcost.eu/

FAIR NEtwork of micrometeorological measurements

CHAIR: Dr Branislava Lalic (RS) branislava.lalic@polj.edu.rs

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The current state of weather-induced agricultural losses, water use for irrigation, the appearance of new invasive species and disease vectors (strongly depending on micrometeorological conditions), new environmental zoning of plant diseases and pests, deforestation, increased urbanization, rural-to-urban migration and increased urban energy consumption for cooling/heating impose scientific and societal request to provide micrometeorological knowledge share platform (Micromet_KSP) in order to communicate: a) compiled an inventory of available and quality proven micrometeorological in situ data sets on the European level and beyond, b) measurement and data management recommendations designed in order to meet FAIR principles and avoid temporal and spatial gaps, c) examples of rural and urban FAIR data sets and d) Q&A exchanged between Action members, stakeholders, specialized user groups and the general public. The FAIRNESS action intends to improve standardization and integration between databases/sets of micrometeorological measurements that are part of research projects or local/regional observational networks established for special purposes (agrometeorology, urban microclimate monitoring). Addressing identified challenges requires an effective transboundary network of researchers, stakeholders (extension services and environmental agencies, local authorities and ministries, SME) and civil society (specialized and general public) from Europe and beyond to identify and fill knowledge gaps, standardize, optimize and promote new environmental-tailored measurement and control procedures, enhance research effectiveness and improve dissemination.

https://www.fairness-ca20108.eu/

Modular energy islands for sustainability and resilience

CHAIR: Prof. Carlos Rebelo (PT) crebelo@dec.uc.pt

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The MODENERLANDS Action aims to merge and systematise the efforts of the European Research and Development (R&D) groups working on Sustainable Energy and the related technologies, in particular wind and wave energy sources, by proposing pathways for incorporation and by promoting the relevant synergies in Research, Education and Training in order to enhance Sustainability in the built environment. MODENERLANDS revisits its safe, smart, modular, cost-effective and socially valuable high performance sustainable Energy Islands for consideration in the plans, design and development of the future sustainable energy infrastructure. Looking forward to future development, MODENERLANDS will work with Modularised Construction of Offshore Floating Platforms aiming at easily extending their size and capacity according to future energy needs. The concept of Modular Energy Island will act as a platform to maximise collection and conversion of the renewable energy sources and efficiently transfer them to the network, exploring cutting-edge Green Hydrogen related technologies for efficient energy storage and transportation. MODENERLANDS will promote synergies that will offer breakthrough scientific developments leading to new concepts and R&D outcome and thereby contributing to the strengthening of the European research and innovation capacities on Sustainable Energy Applications along the European Green Deal lines. The proposed European Network will develop a European-based scientific and technological network with strong scientific multi-/inter-disciplinary features that will work on the exploitation of the research outcomes related to Modular Sustainable Energy Islands by integrating all related stakeholders, thereby intensifying the links among scientific and research groups and Sustainable Energy industry.

https://modenerlands.eu

RNA communication across kingdoms: new mechanisms and strategies in pathogen control

CHAIR: Dr Amy Buck (UK) a.buck@ed.ac.uk

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

A new frontier in RNA biology has emerged in the last decade with findings that RNA is found outside of cells and can transmit information between cells, organisms and species as a form of communication. Pathogens can also exploit extracellular RNA (exRNAs) to enable their infections and exRNAs are associated with numerous infectious diseases in both animals and plants. However there are large gaps in knowledge on exRNA mechanisms, such as how exRNAs are selected for export, how they traffic outside the cell, how they integrate into a functional pathway in a recipient and how pathogens exploit these mechanisms. While there are coordinated efforts to advance exRNAs as biomarkers in the USA, the focus is primarily on exRNA detection in body fluids. Advancing the budding field of exRNA and harnessing its potential in understanding and treating disease urgently requires mechanistic understanding. exRNA-PATH will promote European leadership in this field by integrating a network of investigators examining exRNA communication mechanisms across diverse biological systems, with a specific focus on host-pathogen interactions. exRNA-PATH will facilitate an integrated approach to advancing the exRNA field and aligning applications with sustainable development goals in infectious disease and pest control based on coordinated objectives: i) define an agenda for exRNA research that is rooted in mechanistic understanding, ii) align investigators across diverse biological systems (animals, plants, microbes, fungi) and iii) bridge communication between different stakeholders in the exRNA field to create new synergies and innovative solutions to medical, societal and environmental challenges.

https://exrnapath.eu/

European Research Network on Formal Proofs

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

If testing can reveal errors in computer programs, only formal verification can guarantee their absence. The highest Evaluation Assurance Levels of the Common Criteria for Information Technology Security Evaluation require automatically checked mathematical proofs of correctness. Proofs are also the basis of mathematics and many sciences, and thus are very important in education and research. In many computer technologies, developers and users rely on standard languages and protocols for exchanging data and enabling tool interoperability: TCP/IP for network communication, HTML for web pages, etc. This is however not the case for formal proofs, which is a major bottleneck for their adoption by the industry. The main reason is that, currently, proof systems use mutually incompatible logical foundations. Fortunately, only small parts of the proofs developed in a system use features that are incompatible with other systems. Europe is a leading actor in the area of formal proofs: about 65% of the proof systems of the world are developed in Europe, including the two most used proof assistants, Coq and Isabelle. This action aims at boosting the interoperability and usability of proof systems and making formal proofs enter a new era. For the first time, it gathers all the developers and users of proof systems in Europe. To make the proofs exchangeable, they will express, in a common logical framework, the logical foundations of their systems and develop tools for inter-translation of the proofs developed in individual systems to and from this common logical framework.

https://europroofnet.github.io/

PlatfoRm OF policy Evaluation community for improvED EU policies and Better ACKnowledgement

CHAIR: Mr Gábor Balás (HU) profeedback@hetfa.hu

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The Action PROFEEDBACK aims to foster the networking of the policy evaluation community at EU-level, raise awareness on the importance of evaluation policy research and improve its impact on policy-making. The Platform, following a bottom-up and open approach, will gather researchers and professionals from various scientific fields and sectors to present and evaluate theories, topics, tools and methods of policy evaluation. Results of the Europe-wide assessment of good practices will provide direct and high-quality inputs for national and EU bodies responsible for policy evaluation. Policy evaluation is a key tool in understanding, developing and modernising EU policies, thus there is a growing demand for EU-wide and high quality evaluation services. The main challenge is that currently there is no bottom-up platform for European researchers and professionals working in policy evaluation. They have limited possibilities to discuss common problems, assess country specific practices and share their knowledge in a mutually beneficial and effective way. PROFEEDBACK aims to tackle this challenge with an innovative, complex, cross-sectoral and multidisciplinary approach by: analysing the theoretical and methodological questions of evaluation policy research putting special focus on Cohesion Policy, enriching scientific research of policy evaluation and addressing new challenges, harmonizing fragmented approaches to set the research agenda and to get a common understanding, contributing to the capacity building of the policy evaluation community, involving national and EU policy-makers and the civil society to contribute to evidence-based policy-making, framing a Code of Conduct for the policy evaluation community.

https://profeedback.eu/

A sound proteome for a sound body: targeting proteolysis for proteome remodeling

CHAIR: Dr Olivier Coux (FR) olivier.coux@cnrs.fr

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The ProteoCure COST Action aims at fostering research and innovation in the field of proteolysis with the goal of manipulating the proteolysis machinery for the development of novel, specific and efficient therapies. Proteins are essential molecular actors in every cellular process. From their synthesis to their degradation, they are subject to continuous and precise quality control mechanisms to ensure that they properly and timely take on their functions to fulfil cellular needs. Proteolysis (i.e. degradation of proteins) is a key biological process that directly controls individual protein levels. It also ensures the degradation of abnormal proteins. Malfunctions of the proteolysis machinery leading to accumulation of deleterious proteins or in the opposite to excessive degradation of beneficial ones are implicated in multiple human diseases such as cancers, neurodegeneration, developmental and aging disorders, as well as in infectious diseases. Therefore, manipulating the proteolytic machinery to control abundance of specific proteins is a strategy of enormous potential for therapeutic intervention. ProteoCure will gather European researchers from the academic, clinical, and industry sectors, interested to develop a knowledge-based network fostering research on this issue. By organizing community-building activities, fostering synergies among European scientists and reinforcing the training of the next generation of European researchers, the Action will allow creation of a large and creative exchange hub focusing on normal and pathologic proteolysis, and on the development of innovative tools modulating the level of specific protein(s). The final aim is to facilitate the translation of novel discoveries into products of clinical and/or economical value.

http://www.proteocure.eu

Therapeutical applications of Cold Plasmas

CHAIR: Dr Cristina Canal Barnils (ES)
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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Despite scientific and technological progress in the medical field, the treatments available today are still not completely effective concerning the fight against cancer, tissue regeneration and repair or drug-resistant pathogens, including newly emerging infections. Besides, some of the currently associated therapies associate high economic and/or societal costs. In this sense, Cold Atmospheric Plasmas have emerged as a powerful technique involving a vast number of reactive species (molecules, atoms, ions, electrons, photons, UV & visible radiation) which have demonstrated to affect cells through complex biochemical procedures, opening a great window of opportunity in the novel area known as Plasma Medicine. This has led to an exponential increase in the research in different areas of plasma medicine, including cancer, tissue regeneration and repair and antimicrobial action which are the focus of this MedPlasma COST Action. However, many challenges still threaten this promising field to move forward, such as clarification of the mechanisms involved in the therapeutical action of plasmas and plasma-conditioned liquids, insufficient standardization, or an urgent need for enhanced dialogue and interaction between scientists (plasma experts, biologists), medical doctors or industry among others. In these circumstances, this MedPlasma COST Action aims at establishing a synergistic network that articulates researchers, the medical community, industry or patient associations, among others, and coordinate the European activity in this domain to foster the leadership of Europe in this emerging field.

https://www.plasther.eu/

European Network on International Student Mobility: Connecting Research and Practice

CHAIR: Dr Christof Van Mol (NL) c.vanmol@uvt.nl

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Over the past decades, international student mobility in higher education has expanded rapidly. This growth has sparked a considerable interest in international student mobility (ISM) within different disciplines, research communities, and circles of practitioners and policy makers. However, there is surprisingly little connection and exchange among ISM researchers across these spheres. In addition, ISM scholarship remains strongly restricted to scientific circles, despite the relevance that scientific knowledge on ISM has for the formulation of policy recommendations and for transferring best practices to stakeholders' daily work. This Action responds to the pressing need for systematic interdisciplinary and international exchange of knowledge on theoretical frameworks, research methodologies, findings, and best practice examples in the field of ISM, and for translating scientific findings into recommendations for ISM practice. It is organised around four major thematic areas, namely: 1) Global ISM flows and trends at the macro-level; 2) Social inequalities in access to and during ISM; 3) The social and cultural integration of international students in their host countries; 4) The impact of ISM on graduates' careers. The Action brings together established, early-career investigators (ECIs) and PhD students from different scientific disciplines, countries, and research communities as well as stakeholders from international offices, international student and study abroad organizations, and different policy levels. The Action will offer comparative and practical insights into ISM dynamics by bringing fragmented knowledge together, with the main aim of generating new interdisciplinary and innovative empirical perspectives on the phenomenon and translating these into tangible recommendations for stakeholders.

https://www.enisnetwork.com/

European Network for Innovative and Advanced Epitaxy

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

The world is now facing challenges affecting our daily-life that include, among the most acute, health care, energy, telecommunications, sustainable industry, smart cities and climate action. The successful response to these challenges lies on our ability to solve technological roadblocks related to the development of advanced devices. Material science is at the heart of technological developments. Especially, epitaxy has always been the most powerful technique to fabricate/manufacture materials while controlling their properties at nanoscale, enabling the development of advanced devices. Today, material development becomes more vital than ever. To break down the barriers limiting the development of more efficient devices, continuous innovation is essential. To build the foundation of new epitaxial and material science solutions, a European-level structure in epitaxy is today crucial to enhance knowledge sharing at wide scale thanks to cross-community discussions and exchanges. The COST Action "European Network for Innovative and Advanced Epitaxy", named OPERA, will build a new and innovative European Network composed of expert communities in epitaxial growth focusing on different materials classes: conventional semiconductors, oxides and 2D materials. It aims to bridge the gap between traditionally separated scientific communities, both academic and industrial, having the common goal to combine complementary knowledge, push further the material maturation, and exploit epitaxial combinations of the different material classes in order to unveil new properties and produce new functionalities. Based on this organization, the OPERA COST Action will foster interdisciplinary collaborative research activities allowing maintaining European epitaxy at the topmost worldwide level of research and innovation.

https://cost-opera.eu

Converting molecular profiles of myeloid cells into biomarkers for inflammation and cancer

CHAIR: Prof. Sven Brandau (DE)
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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Myeloid immune cells are important mediators in the pathology of many diseases, especially in diseases associated with chronic inflammation (DACI). Recent advancements in molecular profiling technologies have led to the generation of large data sets, many of those not fully explored yet, but accessible to the entire scientific community via public data repositories. It is the aim of this COST Action to repurpose those data sets, retrieve and curate myeloid cell-specific information, and apply this information to develop novel biomarkers for DACI. To this end, MyeInfoBank will utilise COST networking tools to enable the interaction of molecular biologists, bioinformaticians, immunobiologists, biobank coordinators and clinicians. The concerted activity of these experts on myeloid cell biology (either basic or clinical research) MYE, bioinformatics INFO, and bio-banking BANK, will transform complex molecular information into standardised and applicable biomarkers, which have the potential to improve clinical decision making in a number of socio-economically important diseases.

http://www.mye-infobank.eu

Three-dimensional forest ecosystem monitoring and better understanding by terrestrial-based technologies

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Forest ecosystems across the world are facing high pressures due to climate changes. In many areas, they are in a transition to adopt the changes. However, many are damaged in this process. It is crucial to make forest ecosystems more resistant to face these challenges, through resilience strengthening and close-to-nature forestry. Implementing such approaches and monitoring their progress requires accurate knowledge about forest ecosystems that rely on a forest in situ data at high spatial and temporal resolution. Novel terrestrial-based technologies will play an important part to face these challenges. Such technologies have experienced a fast development in recent years. The forests can now be observed and monitored in a very high spatial and temporal resolution that was not possible even a few years ago. Researchers and practitioners are facing a unique opportunity to deepen the understanding of forest ecosystems and to change the forestry to adopt the climate, environment and industrial changes. Various research groups across EU and beyond are testing such technologies or developing processing algorithms for precision forestry and forest ecology. But further cooperation is strongly required. 3DForEcoTech project aims to establish a strong network of scientists and stakeholders (i.e. practitioners) and sensor manufacturers to synchronise the knowledge, to develop general protocols and algorithms for forest ecosystem state survey and forest functioning, and to make these novel technologies available to a broad audience. Specifically, 3DForEcoTech will develop protocols for data acquisition, processing, fusion for forest inventory and ecological applications, and will establish open-data and open-source algorithm databases.

https://www.3dforecotech.eu/

European andrology network– research coordination, education and public awareness

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

ANDRONET aims to boost research collaboration, education and public awareness in andrology, a field of science that deals with male health. Currently there are no European- or world-wide networks through which researchers and clinicians in andrology can interact. The need for such a network is urgent due to the increasing incidence of infertility and testicular cancer, worrying reports of an association of poor reproductive function with poor health, and male predisposition to serious diseases, including Covid-19, leading to shorter life expectancy in men. Male infertility is common, but the patients are currently treated through assisted reproduction technology with primary burden on women. The aetiology of male reproductive problems is heterogeneous and comprises complex interactions between multiple genes and epigenetic factors, with largely unknown impact of environmental factors including infections. This COST Action proposes to increase multidisciplinary research collaboration and data exchange among andrology centres, and transfer of knowledge to European countries with less developed research. The initial consortium includes centres comprising complementary clinical and research expertise at a very high level, but ANDRONET will expand to reach a critical mass necessary for obtaining new knowledge and its possible commercial exploitation across Europe. ANDRONET aims to improve professional education in andrology which is fragmented among several medical branches and will contribute to the recognition of andrology as a medical subspecialty at European level. ANDRONET will strive to properly inform the public with evidence-based knowledge and thereby increase awareness of increasing male health problems and contribute to development of preventive measures.

http://www.andronet.cat/

Intelligence-Enabling Radio Communications for Seamless Inclusive Interactions

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

INTERACT vision is to go beyond the capabilities of the 5G vision and to make the radio network itself intelligent. This is required in order to enhance the human experience of both human-to-human and humanto-machine communications, and make it seamless, with the perception of no intermediary. Machine learning is an important tool in implementing this vision, since along with advanced network architectures and distributed content provision, it provides a means of implementing many aspects of this network intelligence. However, its use must be informed by theoretical and experimental research on radio channel models, network architectures and signal processing algorithms.

http://interactca20120.org/

Bench to bedside transition for pharmacological regulation of NRF2 in noncommunicable diseases

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Non-communicable diseases (NCDs) such as cancer, diabetes, cardiovascular, neurodegenerative, respiratory or immune diseases, account for 77% of all deaths in the EU and remain the most prevalent and without effective therapy. Networking among multidisciplinary teams that face disease from a perspective of causative pathomechanisms rather than clinical symptoms is the most appropriate approach to overcome this problem. Such pathomechanisms imply the loss of homeostatic functions leading to the pathologic formation of reactive oxygen species, chronic inflammation, metabolic unbalance and proteinopathy. The transcription factor NRF2 is a master regulator of multiple cytoprotective responses and a key molecular link among many NCDs. It provides a unique strategy for drug development and repurposing that is now starting to be translated to the pharmacological and clinical arena. This Action will build a network of excellence for integrating and spreading the existing knowledge and providing innovative services, drugs and tools related to NRF2-pharmacology, with the final goal of boosting the translation to the European industry sector. To achieve this, the Action has already gathered a wide set of professionals from different disciplines (medical chemistry, pharmacology, clinical research, molecular biology, bioinformatics, etc.) and sectors (universities, research centres, hospitals, biobanks, biotech SMEs and pharma companies, etc.). At present the action accounts 24 COST countries (66,7% ITC) plus 2 IPCs and 2 NNC. Among 73 proponents, 7 are SMEs, 18 are ECIs and 53.4% are women. Thanks to COST tools the Action will boost the career of young researchers, wide participation (especially from ITC countries), and spread excellence.

https://benbedphar.org/

Harmonizing clinical care and research on adrenal tumours in European countries

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Adrenal tumours affect more than 3% of the population aged > 50 years, and their absolute prevalence is increasing due to population aging. Most of these tumours are benign and hormonally inactive. However, 2-10% of them are at risk of malignancy, and 20-40% present hormone over-secretion, leading to significant morbidity. Management of adrenal tumours is quite heterogeneous, and this leads to substantial inequality in patient care throughout Europe. In this context, the goal of HARMONISATION is to constitute a multidisciplinary network to harmonise clinical care and research on adrenal tumours throughout Europe. Our focus will be on COST Inclusiveness Target Countries (ITCs). In addition, this collaborative network will establish a modern framework to develop a new generation of real-time and real-life randomized clinical trials, which will be federated and registry-based. For this purpose, HARMONISATION will be organized in five Working Groups: 1) Harmonizing clinical practice for adrenal tumours; 2) Harmonizing adrenal tumour research and -omics practice; 3) Harmonizing Information Technology/Artificial Intelligence (AI) tools towards a standardized registry; 4) Harmonizing the ethical and legal framework required for federated European trials; and 5) Communication, dissemination, and inclusiveness. The successful execution of HARMONISATION's goals is guaranteed by the collaboration of clinicians, researchers, and experts from other relevant fields, including artificial intelligence, data science data protection, legal and ethical issues, and patients' representatives.

https://www.goharmonisation.com/

Intergovernmental Coordination from Local to European Governance

CHAIR: Dr Noémia Bessa Vilela (SI)
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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Achieving coordination between executive actors of territorial units is one of the major challenges of today's politics. External effects and thus the interdependence of political actions beyond borders of sovereign authority have increased dramatically, necessitating better coordination of decision-making and actions across territorial units as well as across levels of government in an increasingly complex environment. The effectiveness and legitimacy of democratic governance in modern States depends crucially on their coordination ability. There is still a serious lack of knowledge among scholars and practitioners on how to organize and process intergovernmental coordination in those various instances. Moreover, there is still no systematic connection between the various research communities dealing with the issues from their separate perspectives, such as federalism, European governance or local and regional governance scholars. IGCOORD aims at connecting those different strands of research to provide systematic and comparable insights in the institutions, mechanisms and processes of intergovernmental coordination in the horizontal and in the vertical direction, across levels of government, policy sectors and territorial units. More specifically, it aims at 1) collecting comparative evidence, 2) distilling basic mechanisms and causal explanations from analytic comparison, 3) developing new collaborative research questions and 4) disseminating those insights and results to inform real-world policy-making. IGCOORD is particularly well suited to tackle those challenges because it links expertise that remained unrelated to date from different countries, (sub-)disciplines and problem situations. Fundamentally, only a broad and diverse network of scholars can generate innovative insights and produce knowledge relevant to the political practice.

https://igcoord.eu/

Maximising impact of multidisciplinary research in early diagnosis of neonatal brain injury

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Five in every 1,000 babies born each year have a condition linked to brain injury. For newborn term infants, lack of oxygen is a common cause of injury; for premature infants, an immature cardiovascular system can lead to brain injury. These injuries can result in death, cerebral palsy, or neurodevelopmental delay. Early diagnosis is essential for risk stratification and targeted neuro-protective strategies. Central to an early diagnosis is continuous brain monitoring. The AI4NICU Action will create a pan-European multidisciplinary network with the clinical and technical expertise required to bring artificial intelligence (AI)-enabled decision-support tools to the neonatal intensive care unit (NICU). These AI tools build on existing cot-side technologies, such as the electroencephalogram, by including machine-learning algorithms to detect biomarkers of brain injury. Neuro-physiological data sets are limited in size and scope and not freely available; AI4NICU will develop the tools necessary to acquire, pool, share, and manage data. These data are often complex and noisy, and standards for developing and appraising machine-learning algorithms are lacking; AI4NICU will create a framework to develop, test, and compare these algorithms. A lack of coordinated effort, sometimes exacerbated by a disconnect between clinicians and scientists/engineers, impedes progress; AI4NICU will expand the research community, consolidate existing fragmented efforts, and create and enhance productive synergies. Working with all stakeholders, AI4NICU will identify roadblocks to clinical implementation and propose designs for clinically useful prototypes. This Action will address the urgent, unmet need to reduce the potentially catastrophic life-long consequences of neonatal brain injury.

https://ai4nicu.org/

Applications for zoosporic parasites in aquatic systems

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FUNDING PERIOD: November 2021 – November 2025

SUMMARY

Zoosporic parasites (i.e. fungal and fungal-like aquatic microorganisms) constitute important drivers of natural populations, causing severe mortality of host. Economic impacts of parasitic diseases are notable in microalgae biotech industry, affecting production of food ingredients and supplements, bioactive medicinal and biofuels. While scientific research on this topic is gaining traction by increasing studies elucidating the functional role of zoosporic parasites in natural ecosystems, we are currently lacking integrated and interdisciplinary efforts for effectively detecting and controlling parasites in the microalgae industry. To fill this gap we propose to establish an innovative, dynamic European network connecting scientists, industries and stakeholders to optimize information exchange, equalize access to resources and to develop a joint research agenda. ParAqua aims at compiling and making available all information on the occurrence of zoosporic parasites and their relationship with hosts, elucidate drivers and evaluate impacts of parasitism in natural and man-made aquatic environments. We aim to implement new tools for monitoring and prevention of infections, and to create protocols and a Decision Support Tool for detecting and controlling parasites in the microalgae biotech production. Applied knowledge on zoosporic parasites can feed-back from industry to ecology, and we therefore will explore whether the developed tools can be applied for monitoring lakes and reservoirs. Short-Term Scientific Missions and Training Schools will be organised specifically for early-stage scientists and managers – with a specific focus on ITC – with the aim to share and integrate both scientific and applied expertise and increase exchange between basic and applied researchers and stakeholders.

https://paraqua-cost.eu/

Network for research, innovation and product development on porous semiconductors and oxides

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The NETPORE COST Action will create an international network of world-class researchers and stakeholders to promote joint ideas and initiatives aiming to bridge the gap between fundamental developments and practical applications of technologies based on porous semiconductors and oxides. Recent fundamental advances in porous semiconductors and oxides have demonstrated promising performances of these platform technologies for a broad range of energy and health applications. But the bench-to-bedside translation of these advances remains challenging. Current factors preventing these technologies from reaching the market are: product reliability, cost-effectiveness of production, uncertain long-term performance and benchmark reference, and added value of final product. NETPORE COST Action network will foster cutting-edge research and innovation in this technological field by providing opportunities for joint projects through Working Groups, bringing together a wide pool of expertise across academia and industry. NETPORE COST Action network will: i) develop of a joint research roadmap to boost the transfer of knowledge by coordinating strategies among different actors with the objective of addressing big societal challenges in energy, health and the environment, harnessing advanced technologies using porous semiconductors and oxides; ii) act as a platform to further advance potentially marketable technologies by identifying strengths and weaknesses, needs and requirements of markets; iii) create venues to disseminate these technological advances and provide technical formation activities for young emerging researchers; and iv) promote networking activities in order to attract talent, build more and better joint research projects with clearly defined objectives to exploit technological advances and open exciting new business opportunities.

http://www.netpore.eu

Waste biorefinery technologies for accelerating sustainable energy processes

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

By 2030, the bio-based economy is expected to have grown significantly in Europe. One of the pillars of this bioeconomy is the concept of BIOREFINERY, the sustainable processing of several kinds of waste and biomass into a spectrum of marketable products and energy. While in the past many research efforts have been conducted towards understanding, modelling and designing conversion processes that can sustain a true circular economy, this KNOWLEDGE IS QUITE FRAGMENTED and UNEVENLY DISTRIBUTED across Europe. Several countries lack proper policies and public engagement to endeavour the challenges ahead. HARMONIZATION must start on ROBUST KNOWLEDGE, and the ability to cover the WHOLE VALUE-CHAIN, from source materials up to the markeatable products... and that's WIRE mission. The WIRE COST Action broadly organizes into 4 KEY WORKING GROUPS (WG) that bring together experts from ACADEMIA, INDUSTRY and TECHNOLOGY TRANSFER organisations and range 1) Raw Materials, 2) Biorefinery Conversion Technologies, 3) Biorefinery Applications and 4) Communication and Dissemination. These WG will proactively contribute to i) Promote circular economy, ii) Promote bioenergy and bioeconomy, iii) Promote Research & Innovation in the field iv) Promote applied research towards biorefineries implementation v) Promote EU-wide harmonisation of the scientific and technical approaches, thus facilitating ENGAGEMENT WITH POLICY-MAKERS and industry vi) Pave the ground for a more effective link with the relevant INDUSTRY sectors and gathering their interest. A series of meetings and events are planned to deliver the main aim of influencing positively the future landscape in Science and Technology in this important field of BIOREFINERIES.

http://wire-cost-eu.ipportalegre.pt/

Promoting Innovation of ferMENTed fOods

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FUNDING PERIOD: November 2021 – November 2025

SUMMARY

Present in all European diets, fermented foods (FF) hold a strategic place due to the benefits they offer in terms of nutrition, sustainability, innovation, cultural heritage and consumer interest. The potential of FF for improving human health but also driving food innovation and local production in the next decades has become highly relevant. The challenge is therefore to federate the scientific community and other key stakeholders working on FF. We want to collectively advance scientific evidence of their health benefits, building a benefits/risk approach in order to promote multi-modal innovation and respond to the expectations of different European communities. The long-term goal of PIMENTO is to place Europe at the spearhead of innovation on microbial foods, promoting health, regional diversity, local production at different scales, contributing to economical and societal development as well as food sovereignty. To respond to this challenge, the scientific and non-scientific community need to join forces and co-construct a multi-stakeholder vision and dynamic in the field of FF. A COST Action is the best means of building this network and enabling this long-term vision to become reality. The wide variety of stakeholders engaged will enable PIMENTO: i) to tightly connect and clarify scientific knowledge on health aspects of FF ii) to tackle technical, societal and legislative bottlenecks behind FF-based innovations iii) to contribute to the establishment of long-term scientific workplaces iv) to disseminate widely define scientific knowledge on FF and define strategic roadmap for future joint research.

https://fermentedfoods.eu/

Multiscale Irradiation and Chemistry Driven Processes and Related Technologies

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Radiation is an inevitable element of the world. It may affect life and likely was involved in its origin. The fundamental understanding of radiation was often at the heart of the most important scientific and technological breakthroughs (Maxwell theory, Einstein photo-effect, relic radiation, synchrotron, FEL, etc.) and it remains so. One of the big current challenges concerns the quantitative understanding of the complex processes in various systems, including the living ones, induced by their irradiation by photons, charged particles, or neutrons. These processes may lead, for instance, to the therapeutic effects of radiation, new pathways for the controlled fabrication of nanosystems with desired properties, energy conversion and storage, catalytic activity, or be in the heart of technologies for the construction of novel light sources. Despite a large variety of possible applications, the fundamental principles of irradiation-driven processes in different systems are similar. One of such features is the multiscale spatiotemporal nature of the processes extending the direct outcomes of irradiation over large time-&-space dimensions and linking them to a variety of relevant phenomena. The advances in this interdisciplinary area became possible only recently due to the development of powerful computers and modern experimental techniques. The Action MultIChem aims to establish a broad international interdisciplinary intersectoral cooperation aiming to advance our fundamental understanding of the multiscale irradiation-driven processes and related technologies paving the path towards major scientific and technological breakthroughs, and socio-economic impacts. These goals require a pan-European approach and COST is the most appropriate instrument for their realization.

http://www.mbnresearch.com/ca20129-multichem/main

European MIC Network – New paths for science, sustainability and standards

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Microbiologically Influenced Corrosion (MIC) is a phenomenon that is increasingly becoming a problem for our society. MIC describes the negative effects a material can experience due to the presence of microorganisms. In Europe, several research groups and other industrial stakeholders are already dealing with MIC. Unfortunately, the discussions are fragmented and the exchange of information is limited. A true transdisciplinary approach of the MIC topic is hardly ever experienced, although this would be logical for this material/biology related challenge. USA, Canada and Australia have strong networks, and develop methods, prevention measures and standards, which we are forced to use, since we do not have a network and combined knowledge to design them according to European standards. This makes us extremely dependent and in some cases, we cannot use these measures or standards because the suggested solutions are prohibited by European laws (e.g. the use of some biocides). Therefore, it is important to initiate a new European MIC network. We need to combine our efforts as experts in different fields and develop our own prevention measures, in close cooperation with industry and plant operators and owners of critical infrastructure. This COST Action will provide the necessary interaction and communication, knowledge sharing, training of personnel and of researchers of different disciplines. We will take a leading role in this process, bringing our own ideas on an equal level with other nations, taking into account our values and attitudes (e.g. environmental protection) and representing greater protection for people, property and the environment.

https://www.euro-mic.org/

Efficient Justice for All: Improving Court Efficiency through EU Benchmarking

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Legal systems all over Europe increasingly suffer from congestion. As the number of court cases increases, the ability of legal systems to produce high-quality, timely court decisions appears to be under pressure. Societal costs of this inefficiency in our legal systems are enormous, as EU citizens, firms and (local) governments face uncertainty, incur legal expenses and are forced to postpone decisions that are often key to furthering investment, wellbeing and growth.

This COST proposal is built on the idea that the only way we can face his challenge head on, is by exploiting the differences in institutional, legal and economic circumstances in EU countries to identify best practices. This idea in itself is not new, and has for example been successfully applied to the benchmarking of electricity networks in EU countries. Likewise, a comparison of legal systems does not have to start from scratch, as a lot of the codification that is required has already been done.

With this proposal, we want to take the crucial next step: by bringing together a strong team of experts in benchmarking with a strong focus on how to handle the heterogeneity that is present in Europe.

https://efficientjusticeforall.org/

Urban Tree Guard – Safeguarding European urban trees and forests through improved biosecurity

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Green infrastructure, including urban forests, has been proposed by European Commission as a strategy to support climate adaptation capacity and sustainable development in the urban areas where over 70% of the EU's population live. Alarmingly, the green infrastructure and especially its characteristic elements, trees, are increasingly threatened by alien pests (insects and pathogens) that are introduced via trade and transports. In a new environment, these pests may become invasive, causing devastating environmental and economic losses, and threatening also unique cultural values such as those linked to veteran trees. The current biosecurity system fails to capture alien pests that often also benefit from the altered climate. New tools and better integration of different knowledge pools are urgently needed to support better biosecurity in urban settings. The Action will bring together a pan-European and international network of scientists and stakeholders to meet this challenge. The network will 1) Collect, share and harmonize scientific and stakeholder knowledge, 2) Accelerate development of innovative technological tools and solutions for biosecurity purposes, 3) Inform policy and support implementation of the EU plant health regime while providing science-based recommendations for decision makers, especially at operational levels, 4) Foster an inclusive and open research environment, with explicit support to young professionals, and 5) Increase European competitiveness in the field of biosecurity, improving also the quality of everyday life for people, especially urban dwellers, in Europe and beyond. A co-created Wiki database, teaching tools for education in urban forest health, and a decision support tool will ensure the long-term impacts of the Action.

https://ub3guard.eu/

Cross-border transfer and development of sustainable resource recovery strategies towards zero waste

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Waste is being generated as a result of population growth, industrialization, and improvement of human standard of living. In the absence of efficient waste management systems, waste ends in landfills and in the environment (through informal discharges) leading to pollution and to a linear economy. Due to increasing awareness of the deleterious effects on the environment and human health, policies are being gradually implemented to motivate a mindset shift from linear to circular (bio)economies and decouple economic growth from use of resources. Full waste recycling and valorisation will play a crucial role in the establishment of sustainable circular (bio)economies. Although waste recycling and valorisation strategies have started to be implemented across borders within Europe, their implementation level is not homogenous and harmonization is needed. FULLRECO4US is an answer to this need and will function as a discussion platform centred on holistic approaches to waste recycling and valorisation, and on the development of new cross-border interdisciplinary and intersectoral networks. These networks, in turn, will cooperate in the development of feasible and environmentally-friendly resource recovery approaches that can be translated into, e.g., competitive research funding applications and contribute to building research and innovation capacity within Europe and beyond. FULLRECO4US will include a set of networking activities such as Short-Term Scientific Missions, Workshops, Conference and Symposium attendance, supported by Working Groups focused on genesis of holistic approaches for waste recycling and valorisation, engagement of stakeholders, and on dissemination and communication of Action's results to enhance impact, consensus, and harmonization of newly built strategies.

https://fullreco4us.eu/

Traces as Research Agenda for Climate Change, Technology Studies, and Social Justice

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

TRACTS brings scholars from disciplines of the social sciences and humanities, together with visual and sound artists, curators, decolonial activists, memorialization experts and legal professionals to bridge current cultural, political and geographical gaps in European research on traces. In response to the recent waves of populism, actors as diverse as environmentalists, human rights activists, and museum professionals have been confronting and creatively deploying the legacies of the long 20th century in Europe. This shows no sign of abating in a Europe marked by rapid technological, environmental and socio-economic changes. As such, mapping the challenges in the realms of social justice, climate change, and technological influence on society requires reflecting on and producing new understandings regarding trace. An inclusive, pan-European network which focuses on traces in the context of pressing challenges of social justice, climate change and technology can inform transformative research agendas and create new paradigms in social sciences and humanities. This Action gathers a critical mass of scholars and practitioners to create such a network at a crucial juncture of the European project. Focusing on the conceptual methodological and ethical challenge of traces, TRACTS develops a comprehensive research coordination and training program, including experimental knowledge production and training for future research leaders. TRACTS will host symposia, workshops, and research meetings to provide a platform for collaboration and exchange in order to advance the state of the art. These will lead to deliverables including joint publications, conceptual, ethical and methodological advancement, Traces Atlas, podcasts, exhibitions, mentoring, and a research database.

http://tractsnetwork.online/

Improving biomedical research by automated behaviour monitoring in the animal home-cage

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Animal use for scientific purposes is guided by the principles of 3Rs (Reduction, Refinement and Replacement). Developing refined experimental conditions can substantially improve animal welfare and importantly, enhance the translational value and data reproducibility. Novel and emerging technologies allow 24/7 collection of behavioural data in undisturbed mice, the most widely used species in biomedical research. These recently developed technologies minimize the impact of stressors, such as human interaction and testing in novel arenas, which are known to influence data collection and animal welfare. It is now possible to assess a more naturalistic behavioural profile in familiar environment, such as the animals' home-cage. In addition to promoting welfare, it can improve research in a wide spectrum of research fields ranging from psychology and neuroscience to translational psychiatry and neurology, and may further provide valuable insights into other types of pathologies and genetic alterations. However, addressing the complex problem of monitoring the full 24-hour behavioural repertoire of a rodent still presents many challenges, with each technology having its strengths and limitations. The aim of this Action is to bring together European organizations developing and using automated home-cage monitoring technologies, combining experts in mouse behaviour, laboratory animal science and data science, to critically and transparently assess the potential of these technologies, to develop user guidelines and standard operating procedures and to identify needs for further technological development, including analysis of big data. The Action will also contribute to building capacities for adoption of these technologies by holding workshops, laboratory rotations and disseminating knowledge.

https://cost-teatime.org/

Opportunistic precipitation sensing network

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Despite advances in remote sensing, precipitation observations remain one of the weakest links in the description of Earth's water cycle. This is especially critical in the face of climate change, human-induced hydrologic changes e.g. due to rapid urbanisation, and consequent increase in frequency and magnitude of extreme events. Opportunistic sensing can greatly improve spatial and temporal resolution of standard precipitation monitoring networks on continental scale by complementing them with measurements from personal weather stations or devices primarily not intended for precipitation monitoring such as commercial microwave links or broadband satellite terminals. The number of opportunistic sensors has already now exceeded traditional in-situ observations by an order of magnitude, and it is increasing exponentially. Nevertheless, it is still unclear how to make this data operationally accessible, achieve robust quality control of these observations, and integrate them into standard observation systems. OPENSENSE brings together scientists investigating different opportunistic sensors, experts from national weather services, owners of sensor networks, and end-users of rainfall products to build a worldwide reference opportunistic sensing community. It will i) overcome key barriers preventing data exchange and acceptance as hydrometeorological observations ii) define standards to allow for large-scale benchmarking of OS precipitation products developing new methods for precipitation retrieval iii) coordinate integration of the opportunistic observations into traditional monitoring networks, and iv) identify potential new sources of precipitation observations. These coordinated activities will boost uptake of OS as precipitation observation methods and enable generation of high-quality precipitation products with unprecedented spatial and temporal resolution.

https://opensenseaction.eu/

Making Early Career Investigators' Voices Heard for Gender Equality

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Over the last decades, European higher education and research systems have been characterized by deep changes, due to globalization and marketization, that have dramatically transformed research careers. While doctoral and postdoctoral researchers constitute a fast-growing workforce, their working conditions have become increasingly precarious and their career prospects uncertain. Those processes tend to exacerbate and create new forms of gendered inequalities for Early Career Researchers (ECRs), first and foremost women – that have been magnified by the COVID-19 crisis (Gewin, 2020). Those inequalities are also reinforced by disparities within academia linked to other social determinants, such as origin, socioeconomic status, sexuality or ability. However, current institutional Research & Innovation (R&I) policies, including gender equality policies, rarely consider ECRs' specific challenges. Moreover, implementing efficient and impactful policies that promote sustainable gender equality remains a great challenge throughout R&I institutions. The main goal of this Action is thus to increase visibility of inequalities faced by ECRs from a gender perspective and to promote a sustainable dialogue between ECRs and stakeholders in the research ecosystem at the systemic level (European & national policy-makers) and at the institutional level (senior researchers, academic managers) by creating a community of gender equality practitioners composed of various stakeholders (ECRs, independent researchers, academic managers, organizations) across Europe. The Action has among its outcomes: training schools for ECRs, scientific publications by ECRs, recommendations & guidelines for academics and policy-makers.

https://gendervoices.eu/

Network on water-energy-food nexus for a low-carbon economy in Europe and beyond

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

An international network of researchers is working with policymakers and the business sector to better understand how the water-energy-food Nexus fosters policy coherence in the domains of water, energy and food, supporting the transition towards a circular and low-carbon economy in Europe. Focus is on job creation, enhancing wellbeing and care for the environment. The Nexus concept is tested at different scales (i.e. local, regional, national, European), while the international dimension is explored through the involvement of international proposers. More Nexus-compliant practices are foreseen through a knowledge sharing hub at European level and beyond. Public-private initiatives pave the path for nexus compliant practices, building on network members' advice. NEXUSNET will deliver examples of nexus compliant decision making, and recommendations to best achieve them, to come-up with an overview of Good Nexus Practices in Europe (policy coherence, nexus-compliant practices and more coherent nexus evaluations). Transdisciplinary approaches are adopted to test Nexus compliant practices with the involvement of relevant stakeholders, while interaction and engagement with current and finished Nexus-related projects will be pursued. Academic nexus knowledge will be translated into practical and applicable knowledge for the private sector or policy makers. A series of intense knowledge transfer and dissemination actions are planned to ensure that the network will have a significant impact in Europe and beyond.

https://nexusnet-cost.com/

Holistic design of taller timber buildings

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

With the worldwide construction sector being responsible for one third of carbon dioxide emissions, as well as forty percent of the world's energy use and waste production, a shift to sustainable and renewable construction techniques is crucial. Engineered timber, champion of the sustainable construction materials, has evolved to a stage that enables the construction of not only family housing but also taller buildings commonly built from concrete or steel. Unfortunately, designing taller buildings made from timber is more demanding than their concrete and steel counterparts. Whereas different designers (architects, structural, fire, acoustic engineers etc.) of concrete buildings can work almost independently, the design of taller timber buildings should be performed with intensive collaboration among the design team members. I.e. the acoustic insulation principles currently used in timber buildings are completely contrary to the design demands originating from wind or earthquake loading. This is just one case, unfortunately the list of design collisions is very long. It is therefore crucial to address taller multi-storey timber buildings from a collaborative and interdisciplinary perspective, considering static, dynamic, fire, acoustic, human health and other aspects in parallel and not in isolation. Only through interdisciplinary analysis and interaction can a set of holistic design guidelines be developed that will enable safe construction of taller timber buildings, as well as respect human wellbeing demands. This action proposal aims to achieve that through intense interdisciplinary work and interaction between different design backgrounds, as well as between academic and design professionals.

https://cahelen.eu/

CorEuStem: The European Network for Stem Cell Core Facilities

CHAIR: Dr Laura Batlle Morera (ES) laura.batlle@crg.eu
FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Biomedical research has significantly advanced in the recent years thanks, in part, to the discovery of human induced pluripotent stem cells (hiPSCs), the development of CRISPR/Cas9 gene editing and the possibility of generating specific differentiation systems and more complex in vitro organ-like structures called organoids. These technologies have become key players in investigating disease modelling, embryology and for novel regenerative therapeutic approaches that currently enter first clinical trials. Core facilities in European research centers and universities providing services in these fields are becoming a reference hub for know-how for these technologies. Furthermore, they establish initial quality control standards and homogenize procedures to enhance reproducibility in biomedical research. However, one of the major challenges for core facilities is to keep track of all advancements in cutting-edge technologies. New protocols, reagents and tools continuously develop and need to be tested. Isolated technical platforms cannot follow the fast-moving technology pace. Therefore, there is an urgent need to join forces and link these core facilities to harmonize methodologies used to increase the overall reprodvucibility of the results produced in different labs, from different institutions within Europe and to increase their impact. CorEuStem is composed of experts in stem cell, differentiation, organoids and gene editing technologies with the aim of joining forces and establishing the first European network for harmonizing procedures and protocols, to organise joint training schools for implementing new cutting-edge technologies emerging in the field and to become a reference point in stem cells, differentiation, organoids and gene editing in Europe and beyond.

https://coreustem.eu/

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(and finishing in 2024)

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COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
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CA19134	■	■					238
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Determinants of Physical Activities in Settings

CHAIR: Dr Ciaran Mac Donncha (IE)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The COST Action "Determinants of Physical ActivitieS in Settings" (DE-PASS) is unique in focus, extent, constitution and as an effective Knowledge Transfer Platform (KTP). DE-PASS will focus exclusively on identifying, understanding and measuring the determinants which promote, maintain or inhibit Physical Activity Behaviours (PABs) across the lifespan and in different settings and translating this knowledge to assist policy makers to achieve greater health impact. European and global society is now largely physically inactive. The health, economic and social benefits of a more active society are enormous. DE-PASS will illuminate why individuals and/or societies adopt a physically active or inactive lifestyle. To date enormous energy has been invested by researchers in answering this question, however, the knowledge gained and the impact achieved through this investment is fragmented, not readily translatable and rarely transcends the state of the art. DE-PASS will achieve the following: 1) Use a settings approach (home, school, work etc.) to bridge the knowledge and translation gap; 2) enact a multi-disciplinary, Pan-European, international network (35 nations, 100+ proposers) of established, young and Early Career Investigators (ECIs) and policy makers; 3) exploit, consolidate and further integrate existing relevant expertise, evidence, resources and influence; 4) develop capacities and careers for ECIs; 5) provide a new European PABs conceptual framework, a best evidence statement and implementation guidelines for policy makers; 6) define and standardise European measurement protocols; 7) establish a new, high functioning, open access European database of determinants of PABs with a cohort extension and 8) define an evidenced based and aspirational Pan-European research harmonisation and implementation strategy.

https://depass.eu/

Language In The Human-Machine Era

CHAIR: Dr Dave Sayers (FI) dave.sayers@cantab.net

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

"Within the next 10 years, many millions of people will be ... wearing relatively unobtrusive... devices that offer an immersive and high-resolution view of a visually augmented world" (Perlin 2016: 85). This is the 'human-machine era', a time when our senses are not just supplemented by handheld mobile devices, but thoroughly augmented. The language we see, hear and produce will be mediated in real time by technology. This has major implications for language use, and ultimately language itself. Are linguists ready for this? Can our theory, methods, and epistemology handle it? LITHME has two aims: to prepare linguistics and its subdisciplines for what is coming; and to facilitate longer term dialogue between linguists and technology developers. How will pervasive augmentation technology affect language in areas such as international law, translation, and other forms of language work? What will this mean for how people identify with specific languages? Could increasing reliance on real-time language technologies actually change the structure of language? Longer term, could developments in brain-machine interfaces serve to complement or even supersede language altogether? Linguistics would be far stronger for robust technological foresight, while developers would benefit from better understanding potential linguistic and societal consequences of their creations. Meanwhile LITHME would shine a light on the ethical implications of emerging language technologies. Inequality of access to technologies, questions of privacy and security, new vectors for deception and crime; these and other critical issues would be kept to the fore. LITHME would equip linguists and stakeholders for the human-machine era.

https://lithme.eu/

LGBTI+ Social and Economic (in)equalities

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The Challenge aims to address LGBTI+ (lesbian, gay, bisexual, trans, intersex and queer) social and economic (in)equalities at times of increased vulnerability for gender and sexual minorities in Europe. The Action will take concrete steps to break scholarly disciplinary silos, work across diverse cultural contexts and engage with Civil Society Organisations (CSOs) and the public at large. We will also work with government, non-governmental policy organisations, trade unions and businesses. With 30 joining members representing 14 European countries and 10 disciplines, three Working Groups (WGs) will be established in areas where social and economic inequalities shape the everyday lives of LGBTI+ people: Families and Communities; Employment and Economic Well-being; and Social and Legal Inclusion. Despite existing legal protections against discrimination, LGBTI+ individuals continue to face challenges in Europe, particularly in certain EU countries and neighbouring nations. These difficulties extend to research networking since academics often remain hidden. Data remains scarce since gender and sexual identity is not commonly surveyed. The network will bring in potentially less visible researchers from across the EU. New academics and PhD students will be mentored and advised on how to build successful careers in LGBTI+ studies. We will also work to encourage governments to include information on gender and sexual identities in data collection and to consider the specific challenges facing these groups when formulating policy initiatives. Broader networking will include the delivery of online courses, Training schools, Short-term Scientific and Policy Missions, and community engagement.

http://Lgbtinequalities.eu

Advancing Social inclusion through Technology and EmPowerment

CHAIR: Dr Geraldine Leader (IE)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Social inclusion is an important element of well-being for people with Autism Spectrum Disorder (ASD) and/or Intellectual Disability (ID). Research has highlighted that social inclusion is facilitated through access to education and employment. Despite this, people with ASD and/or ID have low rates of participation in these domains. Research has demonstrated that Assistive Technology (AT) shows great promise in increasing participation in education and employment. Notwithstanding recent technological advances, there are low rates of adoption of AT throughout Europe by service providers, educators, employers and policymakers. There are several areas of unmet need including: high abandonment rates of AT, lack of inclusion of people with ASD and/or ID in the research process, lack of interdisciplinary and intersectoral collaboration and poor match between technology and the individual with ASD and/or ID. The aim of the COST action is: Build an interdisciplinary, intersectoral pan EU and beyond, network which will enhance social inclusion and empowerment of individuals with ASD and/or ID. This will be achieved by: Evaluating the development of novel AT by providing an interdisciplinary and intersectoral collaboration between all stakeholders using a translational approach to establish standardised practice guidelines for design, development and deployment of AT. Creating knowledge, by providing a database of current AT technologies and their match to employment and educational contexts for users with ASD and/or ID. Promoting the adoption of evidence-based guidelines in relation to use of AT across settings and populations and propagating the use of inclusive design and rigorous research approaches.

https://www.a-step-action.eu

Pan-European Network in Lipidomics and EpiLipidomics

CHAIR: Dr Maria do Rosário Domingues (PT) mrd@ua.pt

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Lipids represent a wide variety of molecules that play different biological roles such as energy resources, structural components or signaling molecules that regulate metabolic homeostasis. Most notably, lipids and oxidatively modified lipids have been found to be involved in regulating important mechanisms mediating tissue injury, inflammation, and related noncommunicable diseases, which are responsible for near 70% of all deaths in developed countries. Lipidomics and Epilipidomics are the most promising strategies for the progress in the knowledge of lipids, aiming at biomarker discovery for the prevention, early diagnosis, monitoring, evaluation of diseases therapeutics. These approaches involve the use of complex protocols, different instrumentation and processing huge amounts of data. Effectiveness, while reducing the high costs associated with these technologies, requires a harmonized multidisciplinary approach involving coordinated actions from pan-European centres of lipidomics investigation. This will avoid unnecessary redundancy, improving reproducibility and ensuring efficient and productive research. LipidNET aims to build and maintain a multidisciplinary Pan European network of researchers, clinicians and enterprises working in the field of lipidomics and epilipidomics to boost a hub of research excellence, advanced knowledge and technology transfer, to promote high level of training for young researches and facilitate clinical translation. LipidNet will include five interactive working groups covering analytical methods and computational approaches in (epi)Lipidomics, clinical significance and applications, lipid signaling and mechanisms of action, dissemination and outreach. LipidNET will forester inclusive networking, promoting new opportunities for collaborative research projects, knowledge and technology transfer, dissemination, caring for young scientists and scientists from target countries, keeping gender balance.

http://www.epilipid.net

Multi-Sectoral Responses to Child Abuse and Neglect in Europe: Incidence and Trends

CHAIR: Dr Andreas Jud (DE) andreas.jud@uniklinik-ulm.de
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

In Europe, millions of children experience abuse or neglect at the hands of those who should care for them. Yet, how many of these children get help, which services they receive by which agency remains largely unknown. Moreover, countries are hardly aware which maltreatment turns fatal. This constitutes a major knowledge gap that is likely due to inconsistent ways of surveying and reporting on child maltreatment services across Europe. Without this information, we cannot know how the systems work, what additional preventive efforts are required, if the interventions fit the victims' needs or if the most vulnerable groups are properly identified. The proposed project addresses this gap by creating a network of experts in child maltreatment and relevant stakeholders and links them in working groups, in order to promote the development of a rigorous, consistent, and comparable methodology for the collection of surveillance data on child maltreatment and maltreatment-related fatalities. Researchers, policymakers, administrators and practitioners will identify best-practice methods of surveillance and recommend efficient ways of implementing them across Europe. Importantly, this network will invite youth and adult survivors of child maltreatment to collaborate in all working group decision-making processes. The four working groups within this network will focus on: 1) definition and operationalization of child maltreatment; 2) promoting secondary analyses; 3) participatory approaches to child maltreatment surveillance; and 4) implementation and dissemination. Final products of these projects will include guidelines for implementation of best practices in child maltreatment surveillance across Europe.

https://liu.se/en/research/barnafrid/euro-can

Unifying Approaches to Marine Connectivity for improved Resource Management for the Seas

CHAIR: Dr Audrey Darnaude (FR) audrey.darnaude@cnrs.fr

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

In a human-altered marine environment, fragmented and subjected to unprecedented climate change, planning sustainable strategies for development requires to understand the distribution of marine biodiversity and how its variations impact ecosystem functioning and the evolution of species. Functional Connectivity characterizes the migratory flows of organisms in the landscape. As such, it determines the ecological and evolutionary interdependency of populations, and ultimately the fate of species and ecosystems. Gathering effective knowledge on Marine Functional Connectivity (MFC) can therefore improve predictions of environmental change impacts and help refine management and conservation strategies for the Seas. This is challenging though, because marine ecosystems are particularly difficult to access and survey. Currently, >50 institutions investigate MFC in Europe, by using complementary methods from multiple research fields to describe the ecology and genetics of marine species. SEA-UNICORN aims at coordinating their research to unify the varied approaches to MFC and integrate them under a common conceptual and analytical framework for improved management of marine resources and ecosystems. For this, it will bring together a diverse group of scientists in order to collate existing MFC data, identify knowledge gaps, reduce overlap among disciplines, and devise common approaches to MFC. It will promote their interaction with connectivity theoreticians and ecosystem modelers, to facilitate the incorporation of MFC data into the projection models used to identify priorities for marine conservation. Lastly, it will forge strong working links between scientists, policy-makers and stakeholders to promote the integration of MFC knowledge into decision support tools for marine management and environmental policies.

https://www.sea-unicorn.com/

High-Temperature SuperConductivity for AcceLerating the Energy Transition

CHAIR: Prof. Joao Pina (PT) jmmp@fct.unl.pt

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Superconductivity is a fascinating state of matter characterised by the absence of electrical resistivity that certain materials exhibit when cooled below a certain cryogenic temperature. Together with other unique properties, like the ability to carry huge currents and trap extremely large magnetic fields, superconductors pave the way for accelerating the Energy Transition. High-temperature superconducting (HTS) materials make possible more compact, efficient, and even disruptive technologies that can be integrated into all the links of the electrical energy chain, boosting its decarbonisation. Despite the potential benefits and successful demonstrators of HTS technologies, they still lack mass penetration in the electrical system. Several reasons pointed out by the industry include concerns on the cost of these systems; the uncertainty about cryogenics' reliability; and the idea that only top-skilled professionals will be able to operate the latter. Other causes relate a lack of systematic knowledge about the design of HTS systems for the grid, and on how to simulate their performance by standard software packages. There is also a general unawareness about these materials, particularly on the reliability of the associated technologies on systems where often the security of supply must always be assured. This COST Action tackles all the above challenges, by a systemic approach that will create the path from materials to devices; foster improved modelling and advanced computation paradigms; provide methodologies and demonstrators for addressing industrial challenges and applications; and develop tools for the economic and sustainability assessment of HTS technologies.

https://hi-scale.eu/

European network for Mediterranean cyclones in weather and climate

CHAIR: Dr Emmanouil Flaounas (EL) em.flaounas@hcmr.gr

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Cyclones are the main weather modulators in the Mediterranean region and constitute a major environmental risk, often producing windstorms and heavy rainfall. Moreover, cyclones play a key role in the regional climate variability by controlling the oceanic circulation and regional water cycle, and by mobilizing and transporting large amounts of dust from North Africa. Despite the recent achievements of the scientific community to provide deeper insight into the atmospheric processes and impacts associated with Mediterranean cyclones, there are still unaddressed scientific challenges that require a coordinated approach. In addition, the lack of direct interaction between academic researchers and weather/climate prediction scientists working in operational centres inhibits the efficient exploitation of fundamental research results to improve atmospheric models in a tangible way. Therefore, it is undeniable that there are potentially large societal benefits from improving cyclone predictions for weather and climate timescales. Efficient networking between stakeholders, operational weather forecasters and researchers is timely and essential to address both challenges of research coordination and operational implementation of scientific results into weather and climate services. This Action will coordinate the activities of researchers in meteorology and climatology and scientists from weather/climate services with the main aims to provide a deeper understanding of Mediterranean cyclones and to improve significantly the European capacity to predict their environmental and climate impacts. In this context, the network will identify, and involve in the network, relevant stakeholders with different backgrounds (e.g. civil protection, re-insurance companies) and co-develop cyclone prediction products tailored to their needs.

https://medcyclones.eu/

Plasma applications for smart and sustainable agriculture

CHAIR: Dr Nevena Puac (RS) nevena@ipb.ac.rs

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

A continuous increase in demand for food caused by population growth represents a serious challenge for the humankind. Even in regions where food is plentiful, safety of the food cycle is increasingly important. Improving sustainability of agriculture and at the same time reducing adverse effects of agriculture on the environment requires efficient technologies that enhance productivity while maintaining food quality and safety. The main aim of this COST Action is to investigate the potential of low temperature plasmas (cold plasmas), as a green alternative to conventional chemicals in agriculture to improve yields, increase size and robustness of plants and to reduce (or eliminate) the need for antifungal agents. It will aim to break the classical field boundaries for new dimension in sustainable agriculture with lower chemical impact. The Action will address the use of plasmas for treating food and packaging. Action aims at combining efforts of numerous European scientific communities dealing with plasma, biology, agriculture and food processing with a goal of identifying and developing applications in the chain of food production. Transfer of plasma technology to industry will be based on understanding of plasma's most important processes with further considerations including (Novel food) legislations, energy consumption, food safety and quality. The Action will help define a new field in science by a coordinated, joint effort across the Europe and broader, through exchange and a better use of resources and by intensive study of the basic mechanisms within the context of the well thought out present or future applications.

https://plagri.eu/

European Network on Future Generation Optical Wireless Communication Technologies

CHAIR: Dr Ali KHALIGHI (FR) Ali.Khalighi@fresnel.fr

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The design of future wireless communication networks that cope with the ever-growing mobile data traffic as well as support varied and sophisticated services and applications in vertical sectors with a low environmental impact is recognized as a major technical challenge that European engineers face today. The COST Action NEWFOCUS will propose truly radical solutions with the potential to impact the design of future wireless networks. Particularly, NEWFOCUS aims to establish optical wireless communications (OWC) as an efficient technology that can satisfy the demanding requirements of backhaul and access network levels in beyond 5G networks. This also includes the use of hybrid links that associate OWC with radiofrequency or wired/fiber-based technologies. Towards this vision, NEWFOCUS will carry out a comprehensive research programme under two major pillars. The first pillar is on the development of OWC-based solutions capable of delivering ubiquitous, ultra-high-speed, low-power consumption, highly secure, and low-cost wireless access in diverse application scenarios. The developed solutions will in particular support Internet-of-Things (IoT) for smart environments with applications in vertical sectors. The second pillar concerns the development of flexible and efficient backhaul/fronthaul OWC links with low latency and compatible with access traffic growth. In addition to scientific and technological advances, NEWFOCUS will serve as a global networking platform through capacity building of all relevant stakeholders including universities, research institutions, major industry players, small medium enterprises, governmental bodies and non-governmental organisations. Within this rich consortium, NEWFOCUS will train experts to accompany related European industries for the standardisation and commercialization of the OWC technology.

https://www.newfocus-cost.eu

Women on the Move

CHAIR: Dr Marie-José Ruiz (FR) marie.jose.ruiz@u-picardie.fr

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Women on the Move is a transdisciplinary network of European researchers who focus on historic and contemporary female labour mobility spanning six centuries to the present. The objective is to show the presence and economic contribution of female migrants in European history by revealing women as active migrants and builders of Europe – with economic means, belongings, assets and social networks – capable to overcome gendered obstacles. This will contradict macro-narratives that present women as vulnerable migrants and economic burdens. Focusing on women's labour mobility will raise the current debates on migration by unveiling women's skills and agency, as well as their constraints and limits as economic actors. The Action suggests a multidimensional and multi-factorial interpretation of migration dynamics and tackles in-migration, out-migration and internal migration in a long perspective to highlight consistencies and exceptions in European historic migration patterns. This will bring out local idiosyncrasies and challenge global narratives on female migration. Women on the Move will create a repository of sources on female migration and will dialogue with policy makers. The Action will organize exhibitions (in- and out-door) to reach out to the public on women's presence in European migration history and their contribution to the European economy. In keeping with the European Union's Gender Equality Strategy 2018-2023, the Action will thus challenge gender-blind perceptions of European migration and deconstruct sexist stereotypes. Women on the Move will bring about informed dialogues on European migration, with knowledge on historic and contemporary women's economic potential, labour power, cultural and social belongings, and networking.

https://www.womenonthemove.eu/

The European Researchers' Network Working on Second Victims

CHAIR: Prof. José Joaquín Mira (ES) jose.mira@umh.es
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Patient Safety is a Priority in Europe. However, unfortunately every year between 8 and 12% of the people admitted to hospitals and around 6% of those in primary care suffer from an adverse event (AE) while receiving healthcare. When an AE does occur, there is a domino effect with healthcare professionals (second victims of these events) also suffering from the knowledge of having harmed their patients (first victims). This second victim phenomenon increases the likelihood of further errors and suboptimal care as consequences of emotional disturbances in the hours after the patient safety event. The overall aim of this Action is to facilitate discussion and share scientific knowledge, perspectives, legislation and rules, and best practices concerning AEs in healthcare institutions to implement joint efforts to support second victims, and to introduce an open dialogue and discussion among stakeholders about the consequences of the second victim phenomenon based on a cross-national collaboration that integrates different disciplines and approaches, including legal, educational, professional, and socio-economic perspectives. This Action will yield innovative solutions through enhancing our understanding of decision-making after patient safety events, ideas for caring for the care provider as a prerequisite for safety and quality of care, promoting debate among stakeholders involved in the understanding of clinical errors and creating new approaches to break the taboo around mistakes, enriching our knowledge of the factors that might contribute to transparency after mistakes, capturing the multi-dimensionality of the second victim phenomenon, and proposing recommendations and interventions useful for the European countries and overseas.

https://cost-ernst.eu/

Network for Optimized Astatine labeled Radiopharmaceuticals

CHAIR: Dr Jean-François GESTIN (FR)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Cancer is a major health concerns for European citizens. Thus, the main research aim of this Network for Optimized Astatine labeled Radiopharmaceuticals (NOAR) COST Action is to successfully demonstrate that one of the most promising radionuclides for Targeted Alpha Therapy (TAT), namely astatine-211, can become the European standard for treatment of certain cancerous pathologies. To this end, an efficient networking is essential among all European stakeholders interested in promoting astatine-211 for medical applications. NOAR COST Action brings together European and international excellence labs, astatine-211 production centers, hospitals, industry and patient associations from more than 20 countries, thus covering the whole value chain of innovation: production, chemistry, radiochemistry, biology, preclinical and clinical research and delivery of radiopharmaceuticals to patients. A European web portal will be created containing information for patients, practitioners, researchers, Industry and as a contact point for National and European patient associations. The idea is to gather forces at the European level in order to implement actions to leverage hurdles to the development of this powerful radionuclide and to identify pathologies in which it will be particularly relevant. A special emphasis will be given to train a new generation of young researchers and PhD students, promoting interdisciplinary competences through international and inter-sectoral mobility. The long-term goal of this project is to make Astatine-211 technology available to all European citizens.

https://astatine-net.eu/

Network for blood pressure research in children and adolescents

CHAIR: Prof. Empar Lurbe (ES) empar.lurbe@uv.es

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Hypertension (HTN) is now responsible for 7.1 million deaths per year worldwide, and largely contributes to cardiovascular and renal diseases such as ischemic heart disease, stroke and chronic kidney disease. Cardiovascular and renal diseases linked to high blood pressure (BP) are the first cause of mortality in Europe with an economic impact cost of approximately 1 billion euros per year. In fact, although most of the adverse outcomes occur in adulthood it has become clear that high BP is a life course problem that can become evident in early life. While few would dispute the importance of taking effective steps to identify and manage this condition in middle-aged and older people, relatively little attention has been paid to the problem of high BP in children and adolescents. As a consequence, despite the latest advances and the wide literature on BP in children and adolescents, the solutions to relevant questions are still pending. Thus, scientific and clinical community, as well as decision-makers, stakeholders and the overall society, must face some critical problems related to the high BP in children and adolescents as a cardiovascular risk factor. The COST Action HyperChildNET is aimed at establishing a European sustainable and multidisciplinary network of internationally renowned researchers, clinicians, early career investigators, health economists, decision-makers, patients, regulatory bodies, nutrition & pharma companies and medical devices manufacturers focusing on acquiring a holistic understanding of the factors affecting high BP in children in order to propose and implement corrective and preventive actions both globally and locally.

http://www.ecog-obesity.eu

Trace metal metabolism in plants

CHAIR: Prof. Hendrik Küpper (CZ)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Many trace metals (TMs) (e.g. Cu, Fe, Mn, Mo, Ni, Zn) are essential for organisms as active centres of enzymes, as about one third of all proteins are metalloproteins. Therefore, TM homeostasis in plants is at the core of many challenges currently facing agriculture and human societies. Low TM bioavailability in many soil types of large world areas causes a reduction in crop production and diminishes nutritional value of food. Some essential TMs (e.g. Cu) have narrow beneficial concentration ranges, while others (e.g. Cd, Hg) are usually only toxic, and in many areas of the world metal toxicity is a severe agricultural and environmental problem. For environmental risk assessment and remediation, as well as improved agriculture (targeted fertilisation and breeding), the mechanisms of TM uptake, distribution, speciation, physiological use, deficiency, toxicity and detoxification need to be better understood. PLANTMETALS aims at elucidating them by the combined expertise of researchers (physiologists, (bio)physicists, (bio)(geo)chemists, molecular geneticists, ecologists, agronomists and soil scientists). It furthermore aims at making this knowledge applicable to the needs of farmers and consumers, with input from companies for translating laboratory results into applied products. This shall be done by integrated scientific, communication and dissemination activities, pooling together our research efforts. Regular meetings within and between the workgroups of this COST network, training workshops for young scientists, as well as by technology transfer meetings will be organised in cooperation with the partner companies within PLANTMETALS, as well as producers and merchants of micronutrient fertilisers.

https://plantmetals.eu/plantmetals-home.html

Researcher Mental Health

CHAIR: Dr Gábor Kismihók (DE) gabor.kismihok@tib.eu

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

ReMO will focus on wellbeing and mental health within academia, a theme of strategic importance for the European Research Area. Previous research shows that low levels of wellbeing and mental health problems have a negative impact on individual, team and organizational performance, triggering significant costs. In addition, institutional context, organizational structure and culture, as well as managerial practices have significant impact on wellbeing and health of employees. Therefore, general insights on the causes of workplace wellbeing and mental health need to be refined with contextual specifics (i.e. in academia) in order to develop tailored, effective and efficient prevention and action programs. ReMO wants to address these limitations using a threefold approach: 1) We aim at developing a conceptual framework and tools that are tailored to the academic context taking into account the specifics and challenges of academia and academic work (e.g. performance management of academics, an increasingly competitive landscape for recruiting and retaining talented employees, increasing challenges of dealing with diversity and internationalization, job insecurity, etc.); 2) We take a multilevel perspective on problems and problem generating mechanisms, but also on positive organizational behavior in support of meaningful work and wellbeing; 3) We use a diversity of methods with short feedback loops between theory and practice. The proposers of ReMO are academics, practitioners, policy makers and consultants for higher education institutions. They represent an international mix of scientific knowledge and practice on researcher mental health and a much needed interdisciplinary (e.g. psychology, sociology, business administration), multilevel (individual, organizational, system) and intercultural perspective.

https://projects.tib.eu/remo

High-performance Carbon-based composites with Smart properties for Advanced Sensing Applications

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The goal of EsSENce is to develop an innovation scientific hub at European and International level, focusing on advanced composite materials reinforced with Carbon based (nano)materials (CNMs). The sharing of ideas and results will boost the development of high-performance composites with sensing properties. Special focus will be given in the utilisation of these materials for the introduction of smart properties to the final composites and their application in the field of sensors development. The aim of EsSENce hub, defined as a collaborative community, is to gather together scientific partners, research groups, technology providers and industrial key players aiming to enhance creativity and collaboration among them, by positioning the entrepreneurial individuals at the centre. Indeed, by building a community with diversity both in the broad sense (gender, ethnicity) and with regards to heterogeneous knowledge, the emergence of novel ideas and practices is fostered thus leading to unique and viable innovations. EsSENce activities will focus on the promotion of the successful results from the involved partners and the utilization of the synergistic effect to improve exploitation and dissemination of knowledge. Dissemination and management actions will be organised to attract the interest of research and industry for higher awareness. The intention is to enable as many groups as possible to participate in a highly integrated innovation environment, which will develop Workgroups, will organize Workshops and Conferences, as well as Training Schools and Seminars. EsSENce will promote mobility among researchers, junior scientists and students working on these fields, while promoting contacts with related industries.

http://www.essence-cost.eu/

Investigation on comics and graphic novels in the iberian cultural area

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The iCOn-MICS Action aims at carrying out Investigation on Comics and Graphic Novels from the Iberian Cultural Area (Spain, Portugal, and Latin America). Today, Iberian comics are struggling to position themselves on the global scene particularly because of past political and economic crises and a strong lack of recognition. Moreover, research works are very scattered leading to redundant initiatives and sources are not easily accessible. iCOn-MICS will address it by structuring an international federating network of researchers, professionals, and end-users on Iberian comics to gather research works and improve access to it and to the sources; strengthening its dissemination and preservation; and improving practices for using comics as an educational tool to highlight and improve the image of this medium. To achieve those objectives, the network integrates 11 European countries, including 7 ITCs and 3 countries of Latin America (IPCs). iCOn-MICS will produce various tools devoted to a broad range of stakeholders including: a database gathering Iberian comics, authors, and research works, a professional website dedicated to Iberian comics promotion, and a guide to use comics as an educational tool. This Action will significantly strengthen Iberian comics identity on the international scene. Moreover, comics as a testimony to countries culture and history will provide a new vision of this Iberian area. Finally, iCOn-MICS will offer broader advances in research on new trends and use of comics as an educational tool. Sustainable synergies created between authors, publishers, readers and researchers in this field will represent solid assets for developing research and industry.

https://iconmics.hypotheses.org/

WATer isotopeS in the critical zONe: from groundwater recharge to plant transpiration

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Understanding water exchange within the critical zone, i.e.the dynamic skin of the Earth that extends from vegetation canopy to groundwater, is vital for addressing key environmental problems linked to the sustainable management of water resources. The main aim of WATSON is to collect, integrate, and synthesize current interdisciplinary scientific knowledge on the partitioning and mixing of water in the critical zone taking advantage of the unique tracing capability of water isotopes. These efforts will allow going beyond the current fragmented knowledge providing a novel conceptual framework on the interactions between groundwater recharge, soil water storage, and vegetation transpiration useful for water resources management across a variety of climatic settings. The Action activities are based on a network of early career and senior scientists from different complementary disciplines who are experts in the use of water isotopes, and stakeholders from governmental agencies and private companies from 19 COST countries and one Near Neighbour Country. Meetings and training events will involve scientists and water managers, facilitating communication between academia and stakeholders, promoting the transfer of the latest scientific findings, and helping to identify research gaps and management priorities. The ultimate goal of the network is to build capacity in the use of robust isotope approaches for water resource management. The deliverables include practical tools, such as maps of groundwater recharge and water sources used by vegetation in different European regions that will enable the translation of scientific cutting-edge knowledge into tangible recommendations to support European agencies responsible for water management in agro-forest systems.

http://www.watson-cost.eu

Network on Privacy-Aware Audio- and Video-Based Applications for Active and Assisted Living

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Europe faces crucial challenges regarding health and social care due to the demographic change and current economic context. Active and Assisted Living (AAL) are a possible solution to face them. AAL aims at improving health, quality of life, and wellbeing of older, impaired and frail people. AAL systems use different sensors to monitor the environment and its dwellers. Cameras and microphones are being more frequently used for AAL. They allow to monitor an environment and gather information, being the most straightforward and natural ways of describing events, persons, objects, actions, and interactions. Recent advances have given these devices the ability to 'see' and 'hear'. However, their use can be seen as intrusive by some end users (assisted persons, and professional and informal caregivers.) The General Data Protection Regulation (GDPR) establishes the obligation for technologies to meet the principles of data protection by design and data protection by default. Therefore, AAL solutions must consider privacy-by-design methodologies in order to protect the fundamental rights of those being monitored. The aim of GoodBrother is to increase the awareness on the ethical, legal, and privacy issues associated to audio- and video-based monitoring and to propose privacy-aware working solutions for assisted living, by creating an interdisciplinary community of researchers and industrial partners from different fields (computing, engineering, healthcare, law, sociology) and other stakeholders (users, policy makers, public services), stimulating new research and innovation. GoodBrother will offset the "Big Brother" sense of continuous monitoring by increasing user acceptance, exploiting these new solutions, and improving market reach.

https://goodbrother.eu/

European Network For Gender Balance in Informatics

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Women are underrepresented in Informatics (Computer Science, Computer Engineering, Computing, ICT) at all levels, from undergraduate and graduate studies to participation and leadership in academia and industry. Increasing female representation in the field is a grand challenge for academics, policymakers, and society as a whole. Although the problem is evident, progress has been invariably slow, in spite of all the momentum and impulse for change happening across Europe. The main aim of this COST Action is to improve gender balance in Informatics through the creation and strengthening of a truly multi-cultural European network of academics working on the forefront of the efforts in their countries, institutions and research communities. We will be building on their knowledge, experiences, struggles, successes, and failures, learning and sharing what has worked and how it could be transferred to other institutions and countries. Among other outcomes, the Action will provide the academic community, policymakers, industry and other stakeholders with recommendations and guidelines to address the following key challenges: i) How to have more girls choosing Informatics as their higher education studies and profession; ii) How to retain female students and assure they finish their studies and start successful careers in the field; iii) How to encourage more female Ph.D. and postdoctoral researchers to remain in the academic career and apply for professorships in Informatics departments; iv) How to support and inspire young women in their careers and help them to overcome the main hurdles that prevent women to reach senior positions.

https://eugain.eu

Protection, Resilience, Rehabilitation of damaged environment

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Humanity faces unprecedented challenges: global warming, overuse of fossil fuel energy and increasing urbanisation. While solutions are becoming increasingly limited, microorganisms represent a realistic hope. For millennia microbes have tirelessly been shaping the Earth's ecosystems and with the right approach, they can be help re-introduce environmental equilibrium. PHOENIX aims to demonstrate the effectiveness of Bio-electrochemical systems (BESs); BESs exploit the biological activity of live organisms for pollutants reduction, recycling of useful elements, synthesis of new products and production of electricity, in the case of microbial fuel cell (MFC). Recent advancements in the field of low power electronics enables the exploitation of these environmental technologies. Activities will be related to the characterization of BESs technologies and their implementation as bio-remediator, bio-sensing, bio-reactor in link with sustainable urban planning and sociology-economic aspect. The integration of bio-technologies in the urban context is a key priority for correct urban planning and minimum environmental impact.

https://www.cost-phoenix.eu/

Rethinking packaging for circular and sustainable food supply chains of the future

CHAIR: Prof. Milena Corredig (DK) mc@food.au.dk

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Food packaging is designed to protect the food through its supply chain, communicate to customers, and to ensure food quality, safety and optimal shelf life. Progress is now needed to secure its circularity, minimize food waste and improve sustainability. CIRCUL-A-BILITY will go beyond the state of the art by jointly addressing the major technical and non technical hurdles for implementation of sustainable food packaging solutions within future circular food supply chains. A food specific, focused action is critical amongst the ongoing debate in sustainable packaging. It is important to share data on the consequences of specific food product – package interactions and to keep the behavior of consumers as a critical focus. CIRCUL-A-BILITY will organize a pan-European network of actors involved in all aspects of food packaging, including material scientists, food scientists, industry end-users, consumer scientists and policy makers. The network will actively work to harmonise and integrate food packaging related research, share information, support industry in the implementation of sustainable packaging systems, create authoritative working groups able to give science based recommendation to consumers, user groups, policy makers and industry. It is expected that such COST action activities will 1) valorize the current technical advances, 2) speed the preparation of prototypes beyond the interest of single stakeholders and to the benefit of the European landscape; 3) avoid duplication of efforts in research in adjacent fields; 4) accelerate technology transfer and entrepreneurship; 5) elevate the scientific capacity and research ranking of the COST working members.

https://projects.au.dk/circul-a-bility

EPIgenetic mechanisms of Crop Adaptation To Climate cHange

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The ultimate objective of this proposed COST action is to define, develop, generate and share new breaking knowledge and methodology for the investigation of epigenetic mechanisms modulating plant adaptation to environmental stresses driven by climate change. No international network has been still created with the aim of standardizing methodology in plant epigenetics/epigenomics and better integrate these data with other "omic" approaches. EPI-CATCH will create a pan-European framework for networking in this under-investigated research field. This COST Action will use a unique cross-disciplinary approach that brings together industrial developers, molecular geneticists, molecular biologists, crop breeders, agronomists, plant pathologists, bioinformaticians. EPI-CATCH will expand new frontiers on both innovative and translational research targeting the new challenges in plant epigenetics. Four main specific objectives will be addressed by four provided working groups (WG): 1) update of the most-recent findings in crop epigenomics related to climate change, 2) development of new concepts and approaches in crop epigenetics and epigenomics that can be transferable in other living organisms, 3) establishment of common standardized pipelines, methods and workflows for generation, analysis and interpretation of epigenetic/epigenomic data, 4) an intense output dissemination and training for early-career scientists. The methodologies, concepts and ideas developed by EPI-CATCH will assist stakeholders to develop future innovative technologies to enhance environmental sustainability of agriculture in a rapid climate change scenario.

https://www.epicatch.eu/

Positive Energy Districts European Network

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Europe is set to be a global role model in energy transition. It has made significant progress in building level innovations and is now stepping up efforts towards city-wide transformation with the pioneering concept of Positive Energy Districts (PEDs). The EU's Strategic Energy Technology Plan (SET-Plan) has set out a vision to create 100 PEDs in Europe by 2025. The concept of PEDs is emerging and the knowledge and skills needed for the planning and designing, implementation and monitoring, as well as replication and mainstreaming of PEDs are yet to be advanced. The challenge is cross sectors and domains, thus the solutions can only be found through collective innovation. This COST Action will drive the deployment of PEDs by harmonizing, sharing and disseminating knowledge and breakthroughs on PEDs across different stakeholders, domains and sectors at the national and European level. It will establish a PED innovation eco-system to facilitate open sharing of knowledge, exchange of ideas, pooling of resources, experimentation of new methods and co-creation of novel solutions across Europe. Additionally, this COST Action will support the capacity building of new generation PED professionals, Early Career Investigators as well as experienced practitioners. It will mobilize the relevant actors from and across Europe to collectively contribute to the long-term climate neutral goal.

http://www.pedeu.net

Cognitive decline in Nephro-Neurology: European Cooperative Target

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Fragmentation between neurological and nephrological expertise has frustrated research into the mechanism of cognitive decline secondary to kidney disease. By for the first time bringing these fields together in CONNECT we establish a novel multidisciplinary field to improve patient diagnosis and care. The developed world is experiencing a growing number of patients with chronic kidney disease (CKD), a complex systemic and potentially fatal disease. With improved long-term life expectancy as the result of kidney replacement therapies, more attention has been given to comorbidities, including cognitive impairment. In CKD patients, both the central and peripheral nervous system are frequently affected. Eventually, this decreases quality of life and eventually dementia with loss of independence in everyday activities. CONNECT aims to coordinate research on cognitive impairment in CKD. This requires exchanging clinical information between nephrologists and neurologists, and between neuroscientists and kidney physiologists, guided by big data analysts. This collaborative network will define new experimental paradigms, their translational value and, in turn, focus on new interventions in the field of cognitive impairment. At the core of this COST Action lie activities that bridge the gaps between these fields and prepare early-stage researchers and clinicians to start new research lines. The interdisciplinary consortium from 22 countries will focus on 1) Pre-clinical research, 2) Clinical trials, 3) clinical practice, 4) Data management and analytics, and 5) Inclusiveness and dissemination of the Action. This COST Action will alleviate disparities in CKD patient care and enable breakthrough research enabling patient diagnosis and early treatments.

http://www.connectcost.eu

Pan-European Network for Climate Adaptive Forest Restoration and Reforestation

CHAIR: Prof. Vladan Ivetic (RS) vladan.ivetic@sfb.bg.ac.rs
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The capacity of forests to mitigate climate change is underutilized. More than two billion hectares of degraded areas worldwide need restoration; in many countries timely reforestation following harvests, disturbances, and land abandonment is lagging; and forest management could be sustainably intensified to sequester more carbon. Increasingly, global change and human-induced disturbances raise the need for accelerating restoration and reforestation programs, although consensus is lacking on which techniques to use and what objectives to pursue. Indeed, a confusing terminology and multiple, often conflicting interests fuel the debate on what constitutes success and appropriate forest management objectives. Additionally, knowledge gained locally is not widely shared and vice versa. Thus there is an urgent need to broaden the experience on climate adaptive forest restoration and reforestation (CAFoRR). Underlying these urgent need, the developing bioeconomy will sharply increase the demand for forest products. The PEN-CAFoRR network of experts from Europe and beyond will respond to these challenges by addressing the entire cycle of forest restoration and reforestation in different ecosystems, by broadening the dissemination of knowledge, and by facilitating an increased scale of planning and implementation of CAFoRR programs. Specifically, PEN-CAFoRR will provide new guidelines for 1) setting restoration and reforestation goals, 2) decision making on need and ways of restoration, 3) selection, 4) production and quality control of targeted forest reproductive material, 5) establishment techniques, and 6) post-planting protection and silviculture. One result will be an open-access database comprising state-of-the-art information on techniques and guidelines of European CAFoRR.

http://www.pen-caforr.org/

Decolonising Development: Research, Teaching and Practice

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The Action DecolDEV takes on the challenge to reconstruct the concept and practice of development after its deconstruction. It aims for a resetting and diversification of the actors, structures, institutions and spaces in which knowledge about and for development is produced, shared, contested and put into practice. The Action will progress beyond the state-of-the-art through exploring and formulating alternatives in three areas: Research, Teaching and Practice.

https://decolonise.eu/

Fintech and Artificial Intelligence in Finance – Towards a transparent financial industry

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The financial sector is the largest user of digital technologies and a major driver in the digital transformation of the economy. Financial technology (FinTech) is aims to compete with traditional financial industry methods in the delivery of financial services. Globally, more than $100 billion of venture capital and growth equity has been deployed to Fintech companies and Artificial Intelligence (AI) since 2010, still growing substantially. In early 2018, the European Commission unveiled their action plan for a more competitive and innovative financial market, and initiative on AI with the aim to harness the opportunities presented by technology-enabled innovation in financial services. Europe should become a global hub for FinTech, with EU businesses and investors able to take most of the advantages offered by the Single Market in this fastmoving sector. We want to facilitate interactions and collaborations between different groups of academics and industry working on Fintech and AI in Finance, to provide theoretic expertise to industrial partners, and to establish a large and vibrant interconnected community of excellent scientists across diverse fields. The key objectives are:

- to improve transparency of AI supported processes by developing a data-driven rating methodology for ICOs;
- to address the disparity between the proliferation in AI models within the financial industry for risk assessment and decision-making, and the limited insight the public has in its consequences by developing policy papers and methods to increase transparency;
- to develop methods to scrutinize the quality of rule-based "smart beta" products across the asset management, banking and insurance industry.

https://fin-ai.eu/

Europe Through Textiles: Network for an integrated and interdisciplinary Humanities

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

EuroWeb fosters a pan-European network of scholars and stakeholders from academia, museums, conservation, cultural and creative industries. Scholars from 13+ disciplines of the Humanities (philology, art history, archaeology, history), Social Sciences (social anthropology, ethnology, economics, law) and Natural Sciences (geochemistry, conservation, chemistry, biology) join forces to bridge current cultural, political and geographical gaps and facilitate interdisciplinary research leading to inspirational material for experts in the allied and applied disciplines of fashion, art and design. The scholarly vision is to re-write European history based on its massive production, trade, consumption and reuse of textiles and dress. The goal is to identify expertise across time in sustainable textile practices. For this purpose, ITCs are crucial for their experience in ancient techniques and cultural heritage in textile craft. EuroWeb consists of 100+ proposers from 24 COST member countries, incl. 15 ITCs. It offers multiple theoretical and practical training schools, mentors, targeted career development masterclasses for the ECIs, with the aim to increase EU funding for ITC scholars and ECIs. Each year, EuroWeb aims to host large international textile and dress conferences in the ITCs, to highlight their collections, capacities and scholarship. EuroWeb enables collaborations between researchers, engineers, scholars and other stakeholders and business by providing a platform for them to collaborate, co-create projects and training schools, and foster trust and shared ideas. Deliverables include collaborative publications, research workshops, theoretical reflection and advancement, digital infrastructure, EuroWeb digital Atlas, films and podcasts, and intense mentoring, training and career development for ECIs.

https://euroweb.uw.edu.pl/

European Network to Advance Best practices & technoLogy on medication adherencE

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Due to an ageing society, there is a steady increase in chronic diseases and multi-morbidity in the EU. This rise of chronic diseases and multi-morbidity requires a multidisciplinary response, which often involves lifestyle changes combined with lifetime medication use. Medication non-adherence affects however up to half of the chronic medication users, poses considerable challenges in managing chronic diseases, and is associated with almost 200,000 deaths and € 80-125 billion of potentially preventable direct and indirect costs in the EU. Technological advances (e.g. smart pillboxes, digital inhalers, tracking devices, e-injection pens, e-Health, big data), have significant potential to support healthcare professionals and empower patients in detecting and managing non-adherence. Awareness of healthcare professionals on the availability and implementation of adherence enhancing technology is limited and there is a lack of collaboration between stakeholders. Successful EU-wide implementation of adherence enhancing technology is further hampered by a lack of insight in different European healthcare systems, reimbursement pathways and policy regulations that significantly differ between countries. This affects not only patients and healthcare professionals, but also manufacturers of technology (mostly SMEs) in their innovation capacity and competitiveness. To address these challenges, the European Network to Advance Best practices & technoLogy on medication adherencE (ENABLE) aims to 1) raise awareness of adherence enhancing technological solutions, 2) foster and extend multidisciplinary knowledge on medication adherence at patient, treatment and system levels, 3) accelerate translation of this knowledge to useful clinical application and 4) work collaboratively towards economically viable implementation of adherence enhancing technology across European healthcare systems.

http://www.enableadherence.eu

Fostering and Strengthening Approaches to Reducing Coercion in European Mental Health Services

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

FOSTREN is an Action designed to establish a sustainable, multidisciplinary network of researchers and practitioners focused on reducing the degree to which mental health services use coercion in hospital and community mental health services. Many people receiving mental health care are subjected to coercive practices such as outpatient commitment in the community and physical restraint in hospital. Such practices can violate human rights and there is a growing international policy momentum to reduce reliance on them. Given the biopsychosocial complexity of mental health service delivery, successful initiatives in this area require sustained multilevel interventions which can be implemented effectively in the long term. Clinical practice in this area is extremely variable across Europe and relevant research activity is highly fragmented. The FOSTREN network will address these issues by enabling research and practice expertise to be exchanged in order to create an integrated framework for mental health service transformation. The network objectives are: to advance understanding of successful interventions to reduce coercion within an implementation science paradigm by building a stable interdisciplinary network of European researchers and practitioners; and to apply this understanding by articulating and communicating best practice to key stakeholders responsible for mental health service delivery. This will be achieved through networking activities organized along four themes: risk factors; alternative interventions; outcomes & recovery; and implementation science. Key deliverables such as a framework for shared datasets and a coercion reduction implementation model will contribute to a pan-European effort to enhance human rights for vulnerable people with mental health problems.

https://fostren.eu/

Distributed Knowledge Graphs

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Knowledge Graphs are a flexible way to represent interlinked information about virtually anything. People from a variety of application domains including biomedical research, public and open data, linguistics, journalism, and manufacturing publish, use, and investigate knowledge graphs. As the publication is done in a decentralised fashion across the web, the knowledge graphs form a distributed system. Due to the ever-increasing uptake of Knowledge Graph technologies in recent years, there are new challenges for research and development including dealing with the scale and the degree of distribution of knowledge graphs, while monitoring and maintaining data quality and privacy. Tackling these research challenges will need a stronger collaboration within the research community, and a joint effort to establish a more functional, decentralized Web of Data. The main aim of the Action is therefore to create a research community for deployable Distributed Knowledge Graph technologies that are standards-based, and open, embrace the FAIR principles, allow for access control and privacy protection, and enable the decentralised publishing of high quality data. To this end, the Action connects European researchers and practitioners from: 1) diverse application domains and 2) the whole life cycle of Distributed Knowledge Graphs, from provisioning to finding, accessing, integrating, programming, deploying, enriching, and analytics. The Action will develop practices for scalable, privacy-respecting, high quality and decentralised Knowledge Graph publication and consumption, reach out to the European industry, and formulate a research agenda.

https://cost-dkg.eu/

Connecting Education and Research Communities for an Innovative Resource Aware Society

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Parallel computing platforms have revolutionised the hardware landscape by providing high-performance, low-energy, and specialized (viz. heterogeneous) processing capabilities to a variety of application domains, including mobile, embedded, data-centre and high-performance computing. However, to leverage their potential, system designers must strike a difficult balance in the apportionment of resources to the application components, striving to avoid under- or over-provisions against worst-case utilisation profiles. The entanglement of hardware components in the emerging platforms and the complex behaviour of parallel applications raise conflicting resource requirements, more so in smart, (self-)adaptive and autonomous systems. This scenario presents the hard challenge of understanding and controlling, statically and dynamically, the trade-offs in the usage of system resources, (time, space, energy, and data), also from the perspective of the development and maintenance efforts. Making resource-usage trade-offs at specification, design, implementation, and run time requires profound awareness of the local and global impact caused by parallel threads of applications on individual resources. Such awareness is crucial for academic researchers and industrial practitioners across all European and COST member countries, and, therefore, a strategic priority. Reaching this goal requires acting at two levels: 1) networking otherwise fragmented research efforts towards more holistic views of the problem and the solution; 2) leveraging appropriate educational and technology assets to improve the understanding and management of resources by the academia and industry of underperforming economies, in order to promote cooperation inside Europe and achieve economical and societal benefits.

https://www.cerciras.org/

International Interdisciplinary Network on Smart Healthy Age-friendly Environments

CHAIR: Ms Carina Dantas (PT) carinadantas@shine2.eu

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

To promote social inclusion, independent living and active and healthy ageing in society, the main aim of NET4AGE-FRIENDLY is to establish an international and interdisciplinary network of researchers from all sectors to foster awareness, and to support the creation and implementation of smart, healthy indoor and outdoor environments for present and future generations. NET4AGE-FRIENDLY further aims to overcome fragmentation and critical gaps at both conceptual and pragmatic innovation level on responsive, age-friendly and sustainable environments in order to address the research-policy future requirements of Europe. The main approach of NET4AGE-FRIENDLY is the establishment of new local or regional ecosystems or by expanding existing ones in each European COST country involved, to work on health and wellbeing in an age-friendly digital world. The ecosystems will consist of citizens, public authorities, businesses/NGOs and research and will be supported by five thematic Working Groups (User-centred inclusive design in age-friendly environments and communities, Integrated health and wellbeing pathways, Digital solutions and large-scale sustainable implementation, Policy development and funding forecast, and Cost-benefit evaluation and market opportunities). The outcomes of the five thematic Working Groups will be obtained in the work of one dedicated Working Group to create a synergised output as Reference Framework. NET4AGE-FRIENDLY will be used as a connector for involving and hosting regular themed sessions with local and regional stakeholders and users' representatives from various countries and backgrounds and for fostering the knowledge among researchers and to promote the involvement of Early Career Investigators, Inclusiveness Target Countries and entrepreneurs.

https://www.net4age.eu/

Sudden cardiac arrest prediction and resuscitation network: Improving the quality of care

CHAIR: Dr Hanno L Tan (NL) h.l.tan@amsterdamumc.nl
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Sudden cardiac arrest (SCA) causes 2 million deaths each year in Europe alone. Since SCA strikes unexpectedly and is lethal within minutes if untreated, solving this problem requires 1) recognizing individuals at risk and designing preventive strategies, 2) providing timely and effective treatment. Because SCA mostly occurs out-of-hospital, SCA victims rely on first-response treatment provided by citizens, firefighters and emergency medical services. There are large regional differences in SCA survival rates across Europe (1-30%). This suggests that regional differences in individual risk prediction, prevention and treatment have a major impact on the chance to survive. To improve survival rates across Europe it is imperative to study: 1) inherited, acquired, and environmental risk factors of SCA across European regions; 2) regional differences in preventive measures and first-response treatment strategies and their effectiveness. The PARQ Action will facilitate this research by forming a pan-European network of excellence in SCA and resuscitation science. This network includes investigators from different disciplines including cardiology, molecular biology, resuscitation science, emergency medicine, general practice and health economics. The main objectives of the project are to promote development of standards for collection of clinical data and biological samples and to harmonize data analysis. This will aid in development of risk prediction models based on inherited, acquired and environmental risks. The PARQ action will focus on European differences in first-response treatment and develop guidelines. In summary, the PARQ Action investigators will enable breakthrough developments to decrease the incidence of SCA and improve survival, while reducing the vast regional European differences in survival rates.

https://parq-cost.eu/

Lobular Breast Cancer: Discovery Science, Translational Goals, Clinical Impact

CHAIR: Prof. Patrick Derksen (NL) pderksen@umcutrecht.nl
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Invasive Lobular Breast cancer (ILC) represents a major cancer type that affects 25,000 patients annually in Europe, representing a severe societal impact. Differential diagnosis is still unreliable due to variable histological criteria, long-term survival is poor in the metastatic setting and the response to chemotherapy is virtually absent. Despite its etiological, pathological, molecular and clinical peculiarities, there is still no specific treatment strategy for ILC patients, which is mostly due to the lack of concerted multidisciplinary efforts. LOBSTERPOT aims to better understand, diagnose and treat ILC. This Action will combine the essential areas of expertise and provide a comprehensive platform to bring together and foster collaborations between epidemiologists, geneticists, biologists, clinicians, data scientists, academic and industry trialists, ethical and legal experts, as well as ILC patient advocacy movements. This Action will bridge the gaps in translational cancer research for ILC, and will provide an unprecedented clinical impact due to the streamlining of the "from bench-to-bedside" principal to enable uniform diagnosis and tailored treatment for ILC patients. To achieve its aims and in agreement with the mission and vision of the COST Actions, LOBSTERPOT will: 1) coordinate EU-wide multidisciplinary ILC research,2) promote capacity-building by developing a unique biobank, state-of-the-art models, exclusive platforms of multi-OMICs and clinical ILC data accessible to the scientific community, 3) advice policy-makers and other key stakeholders,4) provide an attractive structure for the development of ILC-focused clinical trials, and, 5) create a unique training and networking opportunity for young and senior researchers devoted to fight ILC.

https://elbcc.org/Lobsterpot

Process-based models for climate impact attribution across sectors

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Many complex process-based models are available in Europe to project future climate impacts. Yet, the current climate impact research community is fragmented, modeling mostly individual systems. The integration of climate impacts across different natural and societal sectors is only slowly emerging. Likewise, attribution of impacts to climate and other factors is still a strongly under-researched field given that climate change is already strongly manifesting itself, an increasing number of court cases dealing with climate impacts is being negotiated and policy debates on loss and damage are intensifying. This lack of coordination amongst impact modelers and insufficient awareness about impact attribution methods hampers important scientific and political progress and more coordination and networking is urgently needed. Therefore, PROCLIAS aims to develop common protocols, harmonized datasets and a joint understanding of how to conduct cross-sectoral, multi-model climate impact studies at regional and global scales allowing for attribution of impacts of recent climatic changes and robust projections of future climate impacts. The Action will do so by focusing on key interactions of climate impacts across sectors, their accumulated effect, especially of extreme events, the attribution of impacts to climate change and the quantification of uncertainties. PROCLIAS will make use of all COST networking tools to train young researchers to conduct and analyse multi-model simulations in a cross-sectoral way, to support a common platform for collecting impact model simulations and methods for analyzing them and to disseminate the data, code and results to scientists as well as, in a more synthesized form, to stakeholders.

http://proclias.eu/

Focused Ion Technology for Nanomaterials

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The aim of the Action is to create a coordinated effort in the field of ion beam based nanoengineering that will put European researchers and commercial businesses at the forefront of the quickly moving field of functional nanostructured materials. The Action will unite developers and practitioners of focused ion beam technology to enable them to build the most efficient tool sets and application techniques for the identification, fabrication and characterization of next generation functional nanomaterials. The Action will develop ion sources and instrumentation for the sub 10 nm fabrication and materials analysis. These objectives will be reached through Europe wide networking between researchers from theoretical and experimental groups traditionally not interacting closely. The challenge to overcome is the increasing fragmentation of the FIB landscape between operators of established technologies, developers providing new techniques and methods and designers of functional nanomaterials not aware of the possibilities provided by these emerging focused ion beam technology and methods. A tight feedback loop between academic and commercial technology developers with researchers of fundamental ion solid interactions and scientists developing new functional nanomaterials will be formed through a series of conferences, training schools and short term scientific missions. This will enable European researchers to develop bleeding edge functional nanomaterials allowing them to offer solutions to many of the important socioeconomic questions defined by the various research programs in Europe. New and emerging focused ion beam technology developed by the Action will play an important role for Quantum Technologies, Semiconductor Industry, Functional Nanomaterials and Medical applications.

https://www.fit4nano.eu

Integrating Neandertal Legacy: From Past to Present

CHAIR: Prof. Ivor Janković (HR) ivor.jankovic@inantro.hr

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Neandertals are the first human population that can be truly recognized as pan-European phenomenon. Traces of their cultural and/or skeletal remains can be found in most European countries and cover a period of more than 250,000 years. A lot of scientific work has been done on various aspects of their heritage and there is a vast collection of archaeological and anthropological data available. However, there is still a discrepancy in available and updated datasets from various countries. In addition, communication between scientists from various fields and from various countries is still based on personal connections between individual scientists, mostly related to specific projects. This Action is a long overdue attempt to bridge the geographic, language, disciplinary-and-data specific gap, as well as a gap created by traditions of different disciplines in different European countries. Through a combined, scientifically-based and geographically inclusive approach, creation of a growing inclusive database, and promoting dialogue among scientists and creating guidelines for research, a solid base for better understanding of Neandertals can be reached. Further, this will allow a base for inclusion of Neandertal legacy into the present, through scientifically based guidelines for public presentation and further actions for promoting their heritage via inclusion of non-scientific stakeholders, such as administrators, museum and cultural workers, touristic sector, small and medium enterprises and other interested parties.

http://inealcost.inantro.hr/

Leading Platform for European Citizens, Industries, Academia and Policymakers in Media Accessibility

CHAIR: Dr Krzysztof Krejtz (PL) kkrejtz@swps.edu.pl

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The proposed LEAD-ME COST Action aims to help all stakeholders in the field of Media Accessibility and cross-cutting topics (e.g. AI and Interactive Technologies) in Europe to meet the legal milestones requested by the recently passed European legislation. Researchers, engineers, scholars as well as businesses and policy makers will be empowered by LEAD-ME with a common and unique platform which, during the next 48 months, will collect, create, share, and disseminate innovative technologies and solutions, best practices and guidelines, and promote them. Furthermore, it will contribute towards existing and new standards on Media Accessibility among at least 28 European or associated countries. To do so, the LEAD-ME network will make use of the specific tools of the COST Action: meetings and working group meetings; educational institutes, short-term scientific mission; dissemination activities. LEAD-ME will boost a cultural change and the creation of a new mindset when designing tools for professional and private activities for all European citizens of all abilities and disabilities. This COST Action is strongly needed to avoid further fragmentation in the European accessibility scene, challenging the European Single Digital Market idea. The uneven take-up in Europe is the direct result of the complex nature of Media, the background technology involved, the fast-changing technology and business models, and the wealth of EU languages. This counts for both the market and research.

https://lead-me-cost.eu/

Global Digital Human Rights Network

CHAIR: Dr Mart Susi (EE) mart.susi@tlu.ee

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The Network will systematically explore the theoretical and practical challenges posed by the online context to the protection of human rights. The Network will address the matter whether international human rights law is sufficiently detailed to enable governments and private online companies to understand their respective obligations vis-à-vis human rights protection online. It will evaluate how national governments have responded to the task of providing a regulatory framework for online companies and how these companies have transposed the obligation to protect human rights and combat hate speech online into their community standards. The matters of transparency and accountability will be explored, through the lens of corporate social responsibility. The Network will propose a comprehensive system of human rights protection online, in the form of recommendations of the content assessment obligation by online companies, directed to the companies themselves, European and international policy organs, governments and the general public. The Action will develop a model which minimises the risk of arbitrary assessment of online content and instead solidifies standards which are used during content assessment; and maximises the transparency of the outcome. The Action will achieve scientific breakthroughs a) by means of a quantitative and qualitative assessment of whether private Internet companies' provide comparable protection of human rights online in comparison with judicial institutions, and b) in the form of a novel holistic theoretical approach to the potential role of artificial intelligence in protecting human rights online, and c) by providing policy suggestions for private balancing of fundamental rights online.

https://gdhrnet.eu/

European Venom Network

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Venomous organisms produce complex mixtures of bioactive compounds that have evolved through million years of natural selection in evolutionary arms races. As such, they are extremely efficient, being usually effective at a very low concentration via highly specific interactions with key molecular targets (ion channels, enzymes and membrane components), identifying them as ideal candidates for therapeutic and biotechnological development. Venom research is an emerging and highly multidisciplinary field that involves studies of the biodiversity, ecology and evolution of venomous organisms, the structure and function of venom deployment systems, the biochemistry and pharmacology of venoms, the pathophysiological effects that venom induces in prey and predators, and the translational development of venom components for biomedical and biotechnological applications. These different research facets tend to be pursued by different research groups that usually are poorly coordinated in Europe, hampering a full development of venom investigation and applications. The overarching aim of the EVEN COST Action is to foster venom investigation at the European level. The Action will identify priority targets and promising innovative approaches, develop best practice pipelines ensuring consistency across Europe and providing international standards in venom research. Further, it provides a novel platform to promote synergistic interactions between academia, industry and society, and to nurture a new generation of venom researchers with a multidisciplinary expertise. Building a gender, age and geographically balanced network involving all the relevant stakeholders will be the fundamental prerequisite to leverage the extraordinary biochemical warfare enclosed in animal venoms, with an enduring scientific, technological and socioeconomic impact.

https://euven-network.eu/

European Network for assuring food integrity using non-destructive spectral sensors

CHAIR: Prof. Dolores PEREZ-MARIN (SP) dcperez@uco.es

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

There is an increasing need for the food industry to provide information on their products in order to satisfy quality standards and to protect their products from food fraud. Recent developments in technology, and advances in big data analytics, provide the opportunity for step-changes that can transform the role of food integrity assurance from one of just strictly conformance to one that addresses a wide range of business critical concerns, including quality, safety and authenticity solutions. Non-destructive Spectroscopic Sensors (NDSS), such as NIR Spectroscopy, Fluorescence, Raman or Hyperspectral imaging, enable rapid, non-destructive and environmentally-safe assessment of multiple parameters in a variety of food products. Most applications of these technologies in the food industry are made at-line. Industry requires them to be deployed in situ and preferably on-line for full process control over the entire food chain. These requirements introduce constraints on sensor design and calibration development which do not normally apply to laboratory-based instruments. Long-term stability of instruments, robustness of the calibrations, sensor integration in production environments, transferability of data and the building of real-time decision-making systems are critical issues to be considered. SensorFINT will create a vibrant network, combining experience in research, manufacture, training and technology transfer in relation to NDSS. The Action will operate by developing generic solutions to existing and emerging problems in non-invasive food process control building an "smart food control system" as well as developing a cadre of well-trained young researchers who will convert scientific results into a reality that matches industrial needs.

https://www.sensorfint.eu/

COST Actions starting in 2019
(and finishing in 2024)

COST Actions	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Pages
CA18201	■				■		252
CA18202	■						253
CA18203		■					254
CA18204					■	■	255
CA18205					■	■	256
CA18206		■					257
CA18207	■			■			258
CA18208			■	■			259
CA18209		■				■	260
CA18210	■			■			261
CA18212	■						262
CA18213				■	■		263
CA18214					■		264
CA18215					■		265
CA18216		■	■				266
CA18217				■			267
CA18218			■				268
CA18219	■	■					269
CA18220	■	■		■			270
CA18221	■			■	■		271

COST Actions	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Pages
CA18222	■						272
CA18223		■					273
CA18224	■						274
CA18225	■	■					275
CA18226	■	■					276
CA18227			■				277
CA18228					■		278
CA18229	■	■					279
CA18230					■		280
CA18231	■					■	281
CA18232	■						282
CA18233			■				283
CA18234	■						284
CA18235	■	■					285
CA18236					■		286
CA18237	■			■			287
CA18238	■	■					288
CA18239	■						289
CA18240	■		■				290

An integrated approach to conservation of threatened plants for the 21st Century

CHAIR: Dr Ziva Fiser (SI) ziva.fiser@upr.si

FUNDING PERIOD: October 2019 – April 2024

SUMMARY

Even though plants represent an essential part of our lives offering exploitational, supporting and cultural services, we know very little about the biology of the rarest and most threatened plant species, and even less about their conservation status. Rapid changes in the environment and climate, today more pronounced than ever, affect their fitness and distribution causing rapid species declines, sometimes even before they had been discovered. Despite the high goals set by conservationists to protect native plants from further degradation and extinction, the initiatives for the conservation of threatened species in Europe are scattered and have not yielded the desired results. The main aim of this Action is to improve plant conservation in Europe through the establishment of a network of scientists and other stakeholders who deal with different aspects of plant conservation, from plant taxonomy, ecology, conservation genetics, conservation physiology and reproductive biology to protected area's managers, not forgetting social scientists, who are crucial when dealing with the general public.

https://www.conserveplants.eu

Network for Equilibria and Chemical Thermodynamics Advanced Research

CHAIR: Prof. Demetrio Milea (IT) dmilea@unime.it

FUNDING PERIOD: October 2019 – April 2024

SUMMARY

The thermodynamic study of chemical equilibria represents the core of many important branches of chemistry. Coordination and supramolecular chemistry, chemical speciation, molecular modelling, drug design are just few examples. The importance of chemical equilibria, and chemical thermodynamics in general, results from the simple assertion that many properties of elements and compounds depend mainly on their interactions in a given system: the biological activity of an element or molecule, or their environmental impact can be explained by a detailed study of these interactions, whose nature and strength can be evaluated by chemical equilibrium and other thermodynamic studies. For example, speciation modelling based on chemical equilibrium data is commonly used in to improve commercial products performances, investigate the mobility of pollutants and toxicants in the environment, optimize industrial processes, explain the mechanisms of action of biologically active substances. Furthermore, advanced thermodynamic studies yield deeper insights into the mechanisms of these interactions. NECTAR will combine the expertise of the large community of specialists working in this field, creating a network based on the stimulating collaboration between them, promoting knowledge exchange, and achieving high technological progress. All this will be accomplished through a fruitful collaboration between young researchers and experienced scientists, taking into consideration gender balance and maximal geographical distribution. Innovative and integrated theoretical and experimental approaches will be established and optimized. Overall, the outstanding quality of obtained results will serve as benchmark for next decades, allowing their application in the above-mentioned fields and substantially impacting on life quality of next generations.

http://www.cost-nectar.eu

Optimising Design for Inspection

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FUNDING PERIOD: October 2019 – April 2024

SUMMARY

Ultrasound based NDE techniques, energy harvesting and wireless sensor networks are being increasingly demonstrated to be effective in monitoring damage in aerospace components at a laboratory setting (TRL 3). These components include critical elements such as airframe, engines, landing gears and control surfaces. However, there is an urgent need to integrate these approaches and techniques at the inception of an aircraft. This COST Action will bring together the top European experts across these areas to support the development of an integrated framework for optimised self-sensing structures capable of diagnosis and prognosis, together with demonstrators and educational activities, including training programs, which will ultimately lead to cleaner and safer skies. This Action will maximise the full benefit of in service, continuous monitoring of critical aerospace structures by integrating ultrasonic wave based non-destructive evaluation (NDE), energy harvesting and wireless sensor technologies at the design conception phase. Optimisation (sensor/structure), computational modelling, advanced signal processing and advanced design approaches will be integrated to produce a novel framework, design tools and guidelines for the delivery of the first generation of self-sensing aircraft capable of delivering accurate structural prognosis. This will improve maintenance strategies, increase asset availability, bridge the gap between research and industry, enable increased the use of advanced materials, reduce operating costs and ultimately deliver safer and greener air transport solutions.

http://www.odin-cost.com

Dynamics of placemaking and digitization in Europe´s cities

CHAIR: Dr Zsuzsanna Varga zsuzsanna.varga@glasgow.ac.uk
FUNDING PERIOD: November 2019 – May 2024

SUMMARY

This Action will investigate how placemaking activities, like public art, civil urban design, local knowledge production re-shape and reinvent public space, and improve citizens' involvement in urban planning and urban design. Placemaking implies the multiplication and fragmentation of agents shaping the public realm. The Action aims to empower citizens to contribute with citizen`s knowledge, digitization and placemaking to diverse ways of interpreting local identities in European cities. The added value of digitization – understood here basically as the ongoing process of converting any kind of data from an analog into a digital format – (Jannidis/Kohle/Rehbein (2018:179) will be analyzed in the ways in which it impacts urban placemaking processes of local communities. Studying urban placemaking and digital practices of various local communities throughout Europe´s cities, this Action will understand and analyze, The impact of digitization on the common placemaking practices of urban local communities, The changing processes of citizen´s local knowledge production of placemaking, The influence of digitization on the governmentality of the local neighborhoods and co-creation of public space by various societal actors. Drawing on recent theoretical insights that point to the importance of placemaking, widening citizen´s knowledge and wider application of digitization and digital communication, the Action seeks to develop new methods for studying and comparing effects of disseminating local urban knowledge beyond cultural and societal borders. By doing so, it develops European urban research both theoretically and methodologically finding ways of channelling the results into the wider urban planning and governance processes.

http://www.placemakingdynamics.eu

Worlds of Related Coercions in Work

CHAIR: Prof. Juliane Schiel (AT) juliane.schiel@univie.ac.at

FUNDING PERIOD: September 2019 – March 2024

SUMMARY

The COST Action "Worlds of Related Coercions in worK" (WORCK) represents a radical change of perspective on labour history by contending that the coexistence, entanglement and overlapping of diverse work relations has been the rule throughout history. It seeks to overcome the classic divides of labour history discourse (productive/unproductive, free/unfree, capitalist re-capitalist) by linking the stories of work and production with those of violence, expropriation and marginalisation. Neither the male-breadwinner model nor the free wage labourer or the capitalist mode of production can form a blueprint for our endeavour; instead we address the persistence and transformation of coercion and bondage across gender orders, world empires and historical eras. WORCK will establish the following four working groups: "Morphologies of Dependence"; "Sites and Fields of Coercion"; "(Im)Mobilisations of the Workforce"; and "Intersecting Marginalities". This conceptual approach will create an academic space that cuts across standard research fields and enables exchanges between scholars working on topics as various as: construction work in ancient civilisations; indentured work and sharecropping in rural societies; chattel slavery and coolie work; debt bondage, convict labour and military impressment; and coercive mechanisms in household work and wage labour. WORCK bridges the gaps between specialised but hitherto separate subfields. Moreover, it develops an analytical framework that helps to overcome the dominance of the conceptual matrix of the modern West in the humanities and to conceptualise a new history of work. Its activities will result in a collaborative database and a wide range of dissemination activities for a broader public.

https://www.worck.eu/

Glioma MR Imaging 2.0

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FUNDING PERIOD: September 2019 – March 2024

SUMMARY

In Europe, 50,000 new cases of primary glioma occur each year, and this number is expected to rise with the aging population. Well-established international consortia are putting tremendous research efforts into a better understanding of glioma pathology and improved treatment strategies. Magnetic resonance imaging (MRI) only has a minor role in these research efforts, despite being a widely available medical imaging modality and whilst advanced MRI techniques are emerging with great potential for improved characterisation of glioma. To exploit advanced MRI to the fullest, two issues need to be solved: 1) The scattered research landscape in which advanced MRI is being developed for glioma imaging. 2) The limited presence of advanced MRI research in established consortia for clinical work and research in glioma. This Action aims to build a pan-European and multidisciplinary network of international experts in glioma research, patient organisations, data scientists, and MR imaging scientists by uniting the glioma imaging community within Europe and progressing the development and application of advanced MR imaging for improved decision making in diagnosis, patient monitoring, and assessment of treatment response in clinical trials and clinical practice. This Action will bring Europe to the global forefront on glioma imaging research, by providing recommendations and open-access software tools that will accelerate the bench-to-bedside translation of advanced MRI techniques. These scientific developments will further the understanding of glioma pathophysiology facilitating scientific breakthroughs in novel therapies and improve personalised patient management ultimately increasing the quality of life of glioma patients.

http://www.glimr.eu

Biodiversity Of Temperate forest Taxa Orienting Management Sustainability by Unifying Perspectives

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Forests serve economic, social, cultural and environmental purposes, offer habitats for most terrestrial organisms and play a major role in mitigating climate change. Virtually all European forests are impacted by management, with substantial effects on biodiversity and ecosystem functions. Current European indicators of sustainable forest management mostly derive from information traditionally collected for timber production assessment, and include scarce direct information on biodiversity. Time is ripe to change this perspective by valuing existing information able to link forest multi- taxon biodiversity and management through observational and experimental approaches. The Action challenge is to increase the degree of sustainability of European temperate forest management for biodiversity. It will adopt a bottom-up approach by: i) creating a synergy of local research efforts; ii) using information on several taxa to inform sustainable management. The Action network will make available existing information on multi-taxon biodiversity, structure and management for more than 2,100 sampling units across all temperate and hemiboreal forest types, and will involve managers of up to 200 million hectares of forests, as well as a large number of protected areas' managers. Action objectives are to deliver:

- a standardized platform of multi-taxon data for European forests;
- a network of forest sites with baseline information for future monitoring; shared protocols for multi-taxon sampling;
- an analysis of the relationships between multi-taxon biodiversity, structure and management; a coordinated network of forest manipulation experiments;
- indicators and thresholds of sustainable forest management directly tested on biodiversity; management guidelines to be applied foremost in forest certification and within protected areas.

https://www.bottoms-up.eu/en/

Novel tools for test evaluation and disease prevalence estimation

CHAIR: Dr Polychronis Kostoulas (EL) pkost@uth.gr
FUNDING PERIOD: October 2019 – April 2024

SUMMARY

Epidemiological studies assessing disease prevalence are critically important to both the identification and control of pathogens in humans and animals (including zoonosis and food borne outbreaks). However, countries typically collect data in a way that is best suited for their specific needs, and non-standardized sampling strategies and diagnostic methods produce prevalence estimates that cannot be directly compared. Hence, the need for harmonization, which has been often highlighted in reports of relevant EU institutions, like the ECDC and EFSA. Despite the availability of appropriate statistical methods – Bayesian Latent Class Models (BLCMs) – that adjust for the imperfect accuracy of the diagnostic process and produce comparable prevalence estimates, the number of research studies and scientific reports that use them is small compared to the number of instances that use of such methods would have been optimal. The objective of this proposal is to coordinate and promote the implementation of BLCMs through networking and knowledge transfer between BLCM experts and researchers working in statistics, epidemiology, diagnostics and population health. Specifically, we will a) increase the visibility and collaboration of BLCM researchers, b) promote stakeholder engagement, c) provide training and networking opportunities for ECRs and ITC researchers, d) create separate training opportunities for policy makers and stakeholders, e) establish a free online BLCMs repository, f) set up an International society for BLCMs and g) organize the first international conference of this society. The strongest asset of this proposal is its strong interdisciplinary nature and broad network of proposers.

https://harmony-net.eu/

European network for Web-centred linguistic data science

CHAIR: Dr Jorge Gracia (ES) jor.gracia@gmail.com
FUNDING PERIOD: October 2019 – April 2024

SUMMARY

The main aim of this Action will be to promote synergies across Europe between linguists, computer scientists, terminologists, and other stakeholders in industry and society, in order to investigate and extend the area of linguistic data science. We understand linguistic data science as a subfield of the emerging "data science", which focuses on the systematic analysis and study of the structure and properties of data at a large scale, along with methods and techniques to extract new knowledge and insights from it. Linguistic data science is a specific case, which is concerned with providing a formal basis to the analysis, representation, integration and exploitation of language data (syntax, morphology, lexicon, etc.). In fact, the specificities of linguistic data are an aspect largely unexplored so far in a big data context. In order to support the study of linguistic data science in the most efficient and productive way, the construction of a mature holistic ecosystem of multilingual and semantically interoperable linguistic data will be required at Web scale. Such an ecosystem, unavailable today, is needed to foster the systematic cross-lingual discovery, exploration, exploitation, extension, curation and quality control of linguistic data. We argue that linked data (LD) technologies, in combination with natural language processing (NLP) techniques and multilingual language resources (LRs) (bilingual dictionaries, multilingual corpora, terminologies, etc.), have the potential to enable such an ecosystem that will allow for transparent information flow across linguistic data sources in multiple languages, by addressing the semantic interoperability problem.

https://nexuslinguarum.eu

Oxygen sensing a novel mean for biology and technology of fruit quality

CHAIR: Dr Julien Pirrello (FR) julien.pirrello@ensat.fr
FUNDING PERIOD: October 2019 – April 2024

SUMMARY

It is widely accepted that consumption of fruit and vegetable is beneficial to human health due to their content of essential nutrients such as vitamins and antioxidants. Any strategy aimed at increasing fruit consumption must necessarily improve the organoleptic qualities of these commodities since fruit quality is judged by the consumer not at the time of harvest but after a post-harvest period that can be long due to the complexity of the distribution channels. Fruits continue to evolve during their post-harvest shelf life which results in substantial deterioration. Postharvest losses are 30% of total fruit and vegetables production in Europe. Therefore, the control of the ripening process is instrumental to maintaining high nutritional and sensory values and to reducing post-harvest losses. Post-harvest management of fruits relies on controlled or modified atmosphere and on packaging. The recent discovery that factors involved in sensing low oxygen and oxidative stress are involved in ripening opens new research avenues for controlling fruit quality via innovative breeding strategies and new dedicated technologies. By bringing together researchers from different disciplines, the action is anticipated to bring major breakthroughs in the understanding of fruit physiology, thus providing new targets to control fruit quality and post-harvest shelf life. The research will implement advanced methodologies and concepts and will significantly enhance European competitiveness through promoting training of early stage researchers in cutting-edge technologies. By combining studies on different models this Action will lead to advances that will translate into novel practices and technologies to improve fruit sensory and nutritional qualities.

http://roxycost.toulouse-inp.eu/en/index.html

Molecular Dynamics in the GAS phase

CHAIR: Prof. Henning Zettergren (SE) henning@fysik.su.se

FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Emerging highly advanced ion-beam traps and storage rings combined with synchrotrons, X-ray facilities, and high performance computers offer completely new ways to study Molecular Dynamics in the GAS phase (MD-GAS). Cryogenic traps and rings will allow studies of decay and reaction processes involving molecular ions in well-defined conformations and in single or narrow ranges of quantum states. The MD-GAS COST Action aims to further develop and fully exploit the exceptional potential of the above range of tools to unravel the connection between the initial energy transfer in interactions between isolated molecules or clusters and photons, electrons, or heavy particles (ions, atoms, molecules) and the related molecular dynamics in unexplored time domains ranging from sub-femtoseconds to minutes and hours. Furthermore, the Action aims to identify reaction mechanisms and routes that lead to the growth of new molecular species, clusters and aerosols. The new knowledge will be important for fundamental atomic and molecular physics, chemical physics, and for applications in radiation therapy and -damage on the nanoscale, astrochemistry, astrobiology, atmospheric science, and climate research. The MD-GAS Action is organized in three Working groups: 1) New high-performance instrumentation and experimental methods to study gas phase molecular dynamics at ion-beam storage rings and traps, at synchrotrons and X-ray facilities; 2) Survival and destruction of molecules following their processing by heavy particles, electrons, or photons; 3) Charge-, energy flow, and molecular growth processes in intermolecular and intracluster reactions.

http://www.mdgas.eu/

Rural NEET Youth Network: Modeling the risks underlying rural NEETs social exclusion

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FUNDING PERIOD: October 2019 – April 2024

SUMMARY

This proposal encompasses the creation of a European-led multidisciplinary network from countries showing higher NEET youth rates in rural areas. Rural NEETs' Youth Network (RNYN) aims at developing a model of comprehension for rural NEETs' social exclusion risk and protective factors based on the bio-ecological model. It focuses on three specific goals: 1) upholding future research capability, with an emphasis on Early Stage Researchers (ESR) and Inclusiveness Target Countries (ITC); 2) creating a rural NEETs' online observatory; and 3) fostering knowledge use by policy makers and practitioners. The RNYN work plan will be produced by 4 working groups; it will contribute to define a coherent model for future research, based on an intensive survey of national and cross-national trends regarding rural NEETs' profile and support systems, as well as methodological and intervention best-practices in the field. RNYN added value stems from an eclectic theoretical, disciplinary, institutional and international approach and in upskilling ESR in ITC that are more affected by high rural NEET rates. In the long run, RNYN's scientific impact will lead to the creation of a rural NEETs' observatory, integrating ESR in a broad multidisciplinary community and strengthening the COST Inclusiveness Policy. Long-term socio-economic impact is expected to be translated into (inter)national legislation to tackle rural NEETs' needs and promote sectoral innovations. RNYN is a timely proposal by creating networks platforms to organize findings, connect critical mass dealing with rural NEETs and build up research capacity. It is also socially relevant, by aiming at informing policies and on-the-ground practices.

https://rnyobservatory.eu/web/

The Geography of New Working Spaces and the Impact on the Periphery

CHAIR: Prof. Ilaria Mariotti (IT) ilaria.mariotti@polimi.it

FUNDING PERIOD: October 2019 – March 2024

SUMMARY

The aim of the present COST proposal is threefold. First, it aims to share the first outcomes of some funded international research projects on new working spaces as Coworking (CS) and Maker Spaces (MS), which: i) identify new working spaces typologies (tassonomy); ii) reveal their spatial distribution and explain the location patterns. Secondly, through the comparison and dissemination of the first results of these international research activities, the Action aims at identifying, measuring and evaluating the (direct and indirect) effects of these new working spaces (Atlas) in order to understand whether and how they have promoted – with or without the help of public subsidies and planning measures –: a) regional competitiveness, economic performance and resilience; b) entrepreneurial milieu; c) knowledge creation within regional innovation system, retaining knowledge workers and the creative class; d) social inclusion and spatial regeneration of peripheral areas The third aim is to collect, discuss and develop guidelines for tailored policy and planning measures (Tool Box) to foster the positive effects of new working spaces through the promotion of agreements and cooperation with local, regional and/or national public administrations/ stakeholders, as well as try to reduce their negative effects on the neighbourhoods (i.e. gentrification). On the basis of these results, the Action aspires to be followed by a wider research project, which will be prepared for competitive international calls, and will develop empirical analyses about the implementation of the proposed measures in local, regional or national specific context.

https://www.nmbu.no/en/projects/new-working-spaces

China In Europe Research Network

CHAIR: Dr Nana De Graaff (NL) n.a.de.graaff@vu.nl

FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Nowhere has the recent increase in foreign direct investment from rising China been more rapid than in Europe. It ranges from manufacturing, energy, utilities and transport, to financial services, real estate and sports and has been expanding from acquisitions of European firms to greenfield and portfolio investment. The perceived challenges posed by these investments has led to increasing political and media attention, including calls for EU vetting and regulation of acquisitions. Academic research on the phenomenon is however lagging behind these developments. Existing studies moreover tend to have a mono-disciplinary, national or sectoral focus. Over-arching conceptions of the interconnections between investments in multiple sectors and the often cross-European nature and intent of Chinese investments, as well as their political and geopolitical implications, is almost entirely absent. This lack of knowledge does not augur well for the formulation of appropriate policy responses direly needed to engage constructively with rising China. In the light of these scientific gaps and policy needs and by bringing together the leading and pioneering researchers from across Europe and beyond (e.g. China, USA), the aim of this Action is to:a) pool current and stimulate further research on China's deepening economic engagements with Europe b) develop an interdisciplinary, holistic, cross-sectoral and pan-European understanding of the variegated impacts and strategies associated with these engagements; c) comprehend the likely political and geo-political consequences of these; and d) generate input on the policy implications of these issues involving relevant agencies from the EU, member countries, business, trade unions and other interested parties.

https://china-in-europe.net/#

Network for Research in Vascular Ageing

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide, regardless of gender, ethnicity or income. The concept that vascular age, as opposed to chronological age, is better related to the prognosis of CVD is rapidly evolving. Arterial stiffness is an important component of vascular ageing and a potent CVD risk predictor, and as such is emerging as an appealing therapeutic target. Despite recent technological advances for the measurement of vascular ageing in clinical practice, unmet needs remain including: complexity of use and heterogeneity of approaches, insufficient validation in clinical settings, fragmentation of expertise, and lack of research driven studies regarding treatment and head-to-head comparisons between different techniques. Therefore, the aim of the COST action is: To establish a network which will work to refine, harmonise and promote the use of vascular ageing measures, in order to improve clinical practice and to reduce the burden of CVD globally. This will be achieved by: Refining the development of novel, easy-to-use technologies for the diagnosis, prevention, treatment and monitoring of vascular aging by cross-talk between industry and scientists using a translational approach and establishing protocols for validation of new technologies. Harmonising knowledge by initiating a registry to complete clinical validation of the most established surrogate endpoints, including comparisons of techniques, and by initiating peer network driven intervention studies to utilize the multiplicative effect of the network. Promoting a vascular ageing culture and to propagate the use of technologies and preventative strategies, fostering solutions feasible in low income countries.

http://www.vascagenet.eu

European Network for Optimization of Veterinary Antimicrobial Treatment

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

The global antimicrobial resistance crisis has been the driver of several international strategies on antimicrobial stewardship. Despite their good intentions, such broad strategies are only slowly being implemented into "real life". This is particularly unfortunate for veterinary medicine, which is challenged by i) a shortage of experts in key disciplines related to antimicrobial stewardship, ii) few antimicrobial treatment guidelines, and iii) inferior diagnostic tests compared to human microbiology. The aim of this Action, which is composed of 48 proposers from 29 countries, is to optimize veterinary antimicrobial use with special emphasis on the development of antimicrobial treatment guidelines and refinement of microbiological diagnostic procedures. For this purpose, the Action will first survey the state-of-the-art in terms of microbiological diagnostic practices and veterinary treatment guidelines across Europe. Secondly, tools in the form of an extensive European strain database and a standard for making antimicrobial treatment guidelines will be created. Third, Action Participants will exploit these tools for the development and refinement of microbiological methods and European treatment guidelines. Finally, the surveys, tools, diagnostic methods, and treatment guidelines will be disseminated to national and international stakeholders. Furthermore, the Action will recommend priority research areas for future optimization of antimicrobial treatment in animals, and develop a roadmap outlining how European countries can advance to a common high level of veterinary antimicrobial stewardship. The planned investigations and the educational activities will raise the critical mass of expertise in veterinary antimicrobial stewardship in Europe, especially in less resourceful countries and among Early Career Investigators.

https://enovat.eu/

European Burden of Disease Network

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FUNDING PERIOD: October 2019 – April 2024

SUMMARY

What are the most relevant diseases in a country? Which risk factors are the strongest contributors to disease and death? How is the impact of different diseases evolving over time, and how does it compare between countries and within subnational units? As the need for prioritising the use of available resources constantly increases, a timely, sound and comprehensive answer to these fundamental questions is more than ever needed to inform public health decision making. Driven by the impact of the Global Burden of Disease study, several researchers and national and international health institutes have adopted the burden of disease approach to address these questions. The complexity of the burden of disease approach however resulted in major disparities in research capacity across Europe. The burden-eu COST Action will address current challenges by 1) stimulating interaction between existing efforts, 2) supporting technical capacity building at country level, 3) providing a platform to support methodological advances, and 4) addressing the need for an actionable understanding of the process underlying knowledge translation. The Action will have an interwoven structure of 3 vertical and 2 horizontal pillars. The vertical pillars focus on specific burden of disease applications – i.e., non-communicable diseases and injuries (WG1), communicable diseases (WG2), and risk factors (WG3). The horizontal pillars focus on cross-cutting and holistic activities – i.e., burden of disease methodology (WG4) and knowledge translation (WG5). While the vertical pillars reflect the current fragmented nature of the burden of disease universe, the horizontal pillars provide the much-needed bridge between these different worlds.

https://www.burden-eu.net/

Research network for including geothermal technologies into decarbonized heating and cooling grids

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FUNDING PERIOD: October 2019 – April 2024

SUMMARY

The Action addresses the inclusion of geothermal technologies into district heating and cooling systems in Europe to foster the de-carbonization of the heating & cooling market. With regard to technological solution the Action follows a strong bottom – up approach. Shallow-, intermediate as well as deep geothermal methods are considered in monovalent or multivalent grids. Geothermal may act as a heating source, sink or storage and may be combined with other technologies like Carbon Capture and Utilization. The Action covers networking, knowledge exchange & transfer, training and stakeholder interaction activities based on case studies to investigate and promote solutions and roadmaps for raising the RES share in public heating and cooling grids to at least 30% in 2030 and at least 50% in 2050.

https://www.geothermal-dhc.eu/

European network of FURan based chemicals and materials FOR a Sustainable development

CHAIR: Dr Andreia F. Sousa (PT) andreiafs@ua.pt

FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Modern society relies on a huge quantity of polymeric materials. However, today, these materials are still almost exclusively based on fossil-resources and evolution to a more sustainable model of development is required. In this perspective, biomass and, in particular carbohydrates from, for example, low value biomass wastes, are outstanding starting feedstocks for the production of added-value chemicals and products. One of such is 2,5-furandicarboxylic acid (FDCA). Nevertheless, efforts on FDCA-based products development have been scattered in individual scientific activities, and moreover joint efforts between Academy and Industry have also been rare, hampering their successful industrialisation and market introduction. Precisely, this Action will master the scattered pan-European individual efforts to design innovative routes to FDCA-based chemicals and polymeric materials towards lab-to-industry-to-market, by gathering, for the first time, a real critical mass along the complete value-chain, including several experts in FDCA synthesis, polymer science and general materials developing and chemical-physics; together with producer, manufacture and recycling industrial stakeholders; LCA and techno-economic viability experts. The Action will accomplish these targets by pursuing two-parallel strategies. Firstly, supporting an 'holistic vision' in which FDCA synthetic routes, polymers & polymeric materials development, characterisation, as well as key technical, economic, environmental and social factors are considered together, aiming at supporting and identifying solutions to successful market introduction. Secondly, using intersectorial knowledge, supported by dissemination and networking tools to provide an open platform for collaboration and a common vision addressing research, human resources qualification and industrial implementation.

https://www.fur4sustain.eu

PEsticide RIsk AssessMent for Amphibians and Reptiles

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Amphibians and reptiles have been until recently the only two vertebrate classes not directly considered in the environmental risk assessment (ERA) of pesticides. The risks posed by these products on amphibians and reptiles have been assumed to be covered by assessments conducted on other vertebrates. The European Union published in 2013 the two first regulations incorporating specifically amphibians and reptiles into pesticide ERA. Following this legal requirement, the competent EU agency, the European Food Safety Authority, published in February 2018 a scientific opinion reviewing the state of the science relative to pesticide ERA for amphibians and reptiles. The scientific opinion constitutes the basis for the future development of a guidance document that will detail the procedures to be followed for possible pesticide authorization. The scientific opinion highlighted the scarcity of knowledge and identified those aspects that should be addressed before the elaboration of the guidance document to guarantee a protective ERA for amphibians and reptiles while keeping vertebrate testing to a minimum. The action PERIAMAR will establish a multidisciplinary network of scientists from research institutions, regulatory agencies, chemical industry, environment-focused NGOs, and research private business that will analyse the available information and design an ERA protocol for possible implementation in the future guidance document. In addition, networking, training and dissemination activities will contribute to create a critical mass capable to address those knowledge gaps requiring further research on the long term, in order to maintain an ERA scheme safe enough to protect amphibians and reptiles from pesticide impacts

https://periamar.com/

Attosecond Chemistry

CHAIR: Prof. Fernando Martín (ES) attochem@uam.es

FUNDING PERIOD: October 2019 – April 2024

SUMMARY

Recent developments of ultrashort intense light sources operating in the XUV and X-ray spectral regions promise to revolutionize chemistry, as they will give access to dynamical processes occurring in the attosecond time scale (1 asec = 10-18 s), the natural time scale for electronic motion in atoms and molecules. Thus, such light sources will allow one to address new fundamental questions about the role and possible control of electron dynamics in chemical reactivity, to investigate photoinduced charge migration in relevant molecular systems, and to image, with asec resolution, fast structural changes in molecules during proton transfer, isomerization, or motion through conical intersections. Large-scale facilities are currently being developed all over Europe for this purpose (ELI-ALPS, EuXFEL, FERMI, SwissFEL, etc.), accompanied by an increasing demand of accurate theoretical support for an optimal use of these resources. The AttoChem network will coordinate experimental and theoretical efforts to exploit the large potential of attosecond techniques in chemistry, with the aim of designing new strategies for the control of charge migration in molecules by directly acting on the attosecond time scale. This ability will be used to selectively break and form chemical bonds, thus opening new avenues for the control of chemical reactions. The results of the Action are expected to have a significant impact in several areas of chemistry, such as photovoltaics, radiation damage, catalysis, photochemistry, or structural determination. AttoChem will also act as a liaison with the relevant stakeholders to bridge the gap to industrial applications.

http://www.attochem.eu/

Future communications with higher-symmetric engineered artificial materials

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

The HiMat Action has the ambition to promote an international research community proposing innovative solutions to the demand of omnipresent connections in today's society. Higher data rates and shared platforms stimulate a revolution in terms of device technologies in different contexts. These global new trends can only be satisfied if a new class of communicating devices becomes available at millimeter waves. HiMat will investigate the electromagnetic properties of new classes of artificially engineered materials. They are made of periodic cells whose inner structures have higher symmetries, such as glide or twist symmetries. As an example, while a periodic structure is invariant after a translation, a glide-symmetric structure is invariant after a translation and a mirroring. These symmetries lead to marvellous uncommon properties: ultra large bandwidth of operation, reduced losses, scanning capabilities, and enhanced stopband for Electromagnetic Bandgap materials. They have the potential to meet the expectation of new communication devices. The novelty of the subject motivates the need for a diverse network, since it is still difficult to select subactivities independent from each other. Different scientific backgrounds – physics, engineering, numerical modelling, and companies – will definitely contribute to the definition of meaningful research lines. Several young researchers and female investigators are indicators of values promoted by the Action, which will drive the discussions with end-users and policymakers. HiMat will contribute to the impact of European research on public scientific awareness, societal change and economic development, by granting the know-how of an emerging technology and enabling transfer of results for exploitation.

https://symat-cost.eu/

Green Chemical Engineering Network towards upscaling sustainable processes

CHAIR: Dr Ana Rita Duarte (PT) aduarte@fct.unl.pt

FUNDING PERIOD: October 2019 – April 2024

SUMMARY

The objective of this COST action is to promote and boost the industrial application of green chemistry and sustainable technologies, developing the tools for the scale-up and implementation of emerging processes into industry. This can only be successfully achieved through the connection of working groups in emergent areas such as: best use of raw materials; use of clean solvents; efficient use of energy and production of minimal amount of waste. The development of novel processes and high added value products from the integration of highly innovative technologies has been pursued and it is the objective of different programs and projects. Within these settings, GREENERING arises to provide tools and knowledge to the participants enabling them to be highly competitive in new breakthrough developments. To achieve this, the GREENERING consortium will gather experts from academia, industry and technology transfer institutions with the aim to: i) create a network with common interests; ii) create working groups to influence decision makers and stakeholders in adopting sustainable processes; iii) create competitive consortiums able to apply to H2020 competitive calls and iv) increase the entrepreneurial mindset of researchers and particularly young students who with their youth and wilful energy will be able to transpose technology into products. Additionally, this Action will aim to provide long-term collaborations between academic institutions and companies which will ultimately result in the implementation of green processes at industrial scale and transfer of specialized technology into the market, being fully aligned with Europe's interest in creating highly competitive sustainable companies.

https://www.greenering.eu/

Taste and Odor in early diagnosis of source and drinking Water Problems

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FUNDING PERIOD: August 2019 – February 2024

SUMMARY

Unpleasant taste and odor (T&O) of water can indicate quality problems or possible risks for human health and can make water unacceptable by consumers. A plethora of water T&O of natural or anthropogenic origin can enter water at the source, during water treatment or in distribution networks. Resolution of water T&O problems requires integration of a) sensory analysis to describe the problem, b) chemical analysis to determine the identity and concentration of T&O c) assessment of associated risks and d) suitable water treatment to control T&O. Expertise in Europe across those dimensions are yet scattered and fragmented. The main aim of the proposed Action (TOPWATER) is to increase capabilities and capacities in Europe for solving water T&O, by creating the first European network of multi-disciplinary experts, end-users and stakeholders in the field. An "innovation by integration" approach is adopted, incorporating novel cross-sector knowledge transfer from the food sector, new international collaborations, vertical "source to tap" risk assessment strategies and horizontal integration with overlapping sectors, i.e. aquaculture, manufacturers of materials in contact with water, sensors and analytical technologies. TOPWATER will have strong impact in improving protection of public health and water resources, quality of life, use of tap water, consumer's awareness and involvement in water quality issues and professional development of young researchers in the field. It will largely contribute to the implementation of the new (recast) EU Drinking Water Directive and to the development of European leadership in the science and technology of water quality.

https://watertopnet.eu/

New approaches in detection of pathogens and aeroallergens

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Bioaerosols are among the most complex components in the atmosphere. Bioaerosols are relevant as important pathogens in crops and on trees, as aeroallergens in relation to human health and as catalysts for physical processes in relation to climate such as cloud formation processes. For decades the backbone in the European monitoring network of bioaerosols in relation to crop and human health has been simple impactors that trap the bioaerosols on a sticky surface followed by optical identification using microscopes. This approach is both time consuming, expensive and limiting with respect to the progress of science. The last five to ten years a range of new techniques have become available. The techniques can enable a number of scientific breakthroughs in the general understanding of bioaerosols and how they interact with the environment. This COST action will establish an interdisciplinary network of experts currently involved in the detection of bioaerosols using both existing methods as well as upcoming technologies such as real or near real-time technologies from atmospheric chemistry& physics or eDNA methods used in molecular biology. A main objective is to critically address the barriers that limits the penetration of new methods in detection of bioaerosols. The cost action will stimulate both research and technological development, e.g. by developing approaches for integration of multiple methods for detecting bioaerosols and how to handle data using numerical approaches in a big data environment by using fungal spores and pollen as examples.

https://adopt-bioaerosol.eu/

The Core Outcome Measures for Food Allergy

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Food allergy is a major societal challenge in Europe. The disease affects 6%-8% of children under the age of 3 years, and 2-3% of adults and has a quality of life impact similar to other major chronic conditions. Food allergy is a major financial burden, with significant impact on healthcare, education, food and catering industries. New treatments for food allergy are in development. There is however no agreed set of Core Outcomes for evaluating these new treatments. This may prevent the development of effective treatments with marketing approvals from regulatory authorities, for food allergic Europeans. Core Outcome sets ensure that trial outcomes are relevant to patients, clinicians, healthcare providers and regulators; and they allow trial outcomes to be combined in meta-analysis, so that new findings are capitalized on as soon as possible. The Core Outcome Measures for Food Allergy (COMFA) project is a multidisciplinary network involving all relevant stakeholders aiming to advance food allergy research and innovation by a) defining the scope and applicability of food allergy Core Outcome sets; b) developing Core Outcome sets and measurement tools for food allergy; c) reaching a consensus on terminology and definitions of measurement properties for food allergy Core Outcomes. This project addresses the Societal Challenges in Health by improving our understanding of health and our ability to reliably monitor health outcomes and demonstrates new options for healthcare delivery. The outcomes will help improve the quality of clinical trials, and the Action will advance the career of young researchers, strengthening Europe's leading position in pharmaceutical sciences.

https://comfa.eu

Global Atrocity Justice Constellations

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FUNDING PERIOD: September 2019 – March 2024

SUMMARY

Most research on atrocity crimes has been focused the international criminal courts and tribunals (ICTs). These institutions were created from the mid1990s to adjudicate criminal responsibility for genocide, crimes against humanity and war crimes. The ICT-centred perspective (that also pervades popular and political discourse) is problematic because it overlooks the larger space in which these courts exist. Global Atrocity Crimes Constellations (JUSTICE360) reverses the ICT-centred paradigm to focus instead on how ICTs are received in domestic contexts and how this reception shapes the space in which they work. Through this change of perspective, the Action constructs an unprecedented panoramic view on the global and cross-systemic impacts of international criminal justice. Under this new paradigm, ICTs are seen as institutions working in larger global atrocity justice constellations. Such constellations are comprised especially of states, state institutions, civil society, and population at large. By conducting case studies in almost 40 countries representative of the larger global relations between states and ICTs, JUSTICE360 will build unique data on how such states perceive and handle international crimes, perpetrators and victims. This data will be built as a collective endeavour by an interdisciplinary research group representative of the countries selected for case studies. Through this unprecedented study of global atrocity justice constellations, JUSTICE360 will contribute highly original knowledge not only on how domestic systems have responded to international crimes, victims and perpetrators; but also how these responses have shaped and reshaped the space in which ICTs work and thus their effectiveness and potential for success.

https://justice-360.com/

NON-CONVENTIONAL YEASTS FOR THE PRODUCTION OF BIOPRODUCTS

CHAIR: Dr Elia Tomás Pejó (ES) elia.tomas@imdea.org

FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Economically viable conversion of low-cost renewable feedstock into biofuels and biochemicals is of outmost importance to the establishment of a robust bioeconomy. In this context, the use of microorganisms for the generation of bioproducts from renewable resources offers many advantages. More specifically, yeasts have great potential to generate industrially relevant compounds from natural sources and wastes in a cost-effective and environmentally friendly manner. Non-conventional yeasts are attracting more and more attention owing to their potential to metabolize complex carbon sources, their alternative metabolic routes and their ability to cope with wide range of process conditions. In this context, this Action calls for a strong investment in capacity building through molecular biology, genetic and physiology studies of the non-conventional yeast-derived bioproducts synthesis, which at the moment is relatively scarce. Improving the knowledge on how non-conventional yeasts strains metabolize unusual substrates (carboxylic acids and biomass-derived sugars) or accumulate unusual products (food additives, enzymes, lipids), are fundamental issues to boost the transition to a more sustainable industry based on renewable raw materials. This Action brings together an innovative group of researchers with the combination of skills and experience to unravel how non-conventional yeast can be successfully implemented in a biotechnology industry. Besides, the Action will gather European top scientists in the field and thus become an important pillar worldwide. Participants will be given the opportunity to network and collaborate which otherwise will be limited. Furthermore, with the help of the Action, European scientists will set the future standards for research on non-conventional yeasts.

https://yeast4bio.eu/

Interactive Narrative Design for Complexity Representations

CHAIR: Prof. Hartmut Koenitz (NL) hkoenitz@gmail.com
FUNDING PERIOD: December 2019 – June 2024

SUMMARY

The aim of this COST action is to build a network for the interdisciplinary study of the potential interactive digital narrative has as a means to addressing complexity as a societal challenge by representing, experiencing and comprehending complex phenomena and thus also address the issue of "fake news". The challenge therefore is to change IDNs current status from 'singular achievement' of a small group of 'initiated' practitioners to 'general practice' of many media companies. The INDCOR project (Interactive Narrative Design for COmplexity Representations) addresses this challenge by means of a coordinated effort in analysing and generalising design and production methods of stand-out IDN works with a particular focus on the representation of complex issues.

https://indcor.eu/

Multi3Generation: Multi-task, Multilingual, Multi-modal Language Generation

CHAIR: Dr Anabela Barreiro (PT) anabela.barreiro@inesc-id.pt
FUNDING PERIOD: September 2019 – March 2024

SUMMARY

Language generation (LG) is a crucial technology if machines are to communicate with humans seamlessly using human natural language. A great number of different tasks within Natural Language Processing (NLP) are language generation tasks, and being able to effectively perform these tasks implies 1) that machines are equipped with world knowledge that can require multi-modal processing and reasoning (e.g. textual, visual and auditory inputs, or sensory data streams), and 2) the study of strong, novel Machine Learning (ML) methods (e.g. structured prediction, generative models), since virtually all state-of-the-art NLP models are learned from data. Moreover, human languages can differ wildly in their surface realisation (i.e. scripts) as well as their internal structure (i.e. grammar), which suggests that multilinguality is a central goal if machines are to perform seamless language generation. Language generation technologies would greatly benefit both public and private services offered to EU citizens in a multilingual Europe and have strong economic and societal impacts.

https://multi3generation.eu/

Mathematical models for interacting dynamics on networks

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FUNDING PERIOD: October 2019 – April 2024

SUMMARY

Many physical, biological, chemical, financial or even social phenomena can be described by dynamical systems. It is quite common that the dynamics arises as a compound effect of the interaction between sub-systems in which case we speak about coupled systems. In this action we shall study such interactions in particular cases from three points of view: the abstract approach to the theory behind these systems, applications of the abstract theory to coupled structures like networks, neighbouring domains divided by permeable membranes, possibly non-homogeneous simplicial complexes, etc., modelling real-life situations within this framework. The purpose of this Action is to bring together leading groups in Europe working on a range of issues connected with modelling and analyzing mathematical models for dynamical systems on networks. We aim to develop a semigroup approach to various (non-)linear dynamical systems on networks as well as numerical methods based on modern variational methods and applying them to road traffic, biological systems, and further real-life models. We also explore the possibility of estimating solutions and long time behaviour of these systems by collecting basic combinatorial information about underlying networks.

http://www.mat-dyn-net.eu

European Network for Innovative Diagnosis and Treatment of Chronic Neutropenias

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Chronic neutropenias (CNP) represent a wide spectrum of disorders ranging from mild to life-threatening, acquired or congenital diseases. The pathophysiological mechanisms underlying CNPs are diverse and vary from haemopoietic stem cell and bone marrow microenvironment defects resulting in impaired neutrophil production, to immune disturbances leading to accelerated apoptosis of neutrophil progenitors and/or the circulating mature neutrophils. The prognosis of patients with CNP is related to the underlying pathogenesis, the degree of neutropenia and the propensity for leukaemic transformation. Accurate diagnosis is mandatory for risk stratification and treatment choice. The principal challenge of the Action is to establish a wide network of researchers with special interest in CNPs and facilitate interactions and collaborations among top-level European experts and young investigators from different scientific areas i.e. Clinical and Laboratory Haematology, Immunology, Genetics, Molecular Biology and Regenerative Medicine. The main aims of the Action are: a) to promote science, training and education on advanced biochemical, immunological, genetic and molecular biology techniques for the accurate diagnosis and treatment of patients with different types of CNP, early recognition of Myelodysplastic Syndromes/Acute Myeloid Leukaemia evolution and appropriate intervention, b) to link and further expand existing neutropenia networks for a more multidisciplinary approach of CNP that will result in a better characterization of the underlying diseases and development of individualized and precision medicine therapeutic approaches for selected patients, c) to organize and expand CNP patient Registries and Biobanks using homogenized protocols in line with the ethical standards of the European Legal Framework and the relevant national regulations.

http://www.eunet-innochron.eu

Computational materials sciences for efficient water splitting with nanocrystals from abundant elements

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FUNDING PERIOD: November 2019 – May 2024

SUMMARY

Modern society in Europe needs a source of energy that is generated without harming the environment. The efficiency of renewable energy converting devices such as water splitting with electrochemical cells based on nano-scaled oxides relies on a sensible choice of material components. However, larger scale material and device properties such as interface segregation, grain boundary movement, ionic diffusion through porous materials, and mechanical loading also strongly impact performance, making the theoretical simulation of realistic devices a challenging multi-scale problem. Although our scientific community has developed expertise in the individual modelling fields, much less effort has been devoted to integrating and combining the scales toward a multi-scale approach. The ultimate central challenge will be to generate a multiscale modelling platform that will be used world-wide for conducting state-of-the-art multi-scale property prediction of materials. This Action intends to focus on bridging the knowledge gaps between different theoretical methods and computer codes in order to facilitate the discovery of novel materials for energy conversion. The objectives of this challenge include building an organized network of European scientists working on achieving greater scientific understanding of water splitting and developing approaches for reliable and realistic multi-scale modelling of nano-oxides material architectures. This Action will also develop initiatives to train young scientists, as well as inform computational users throughout the development and production. The longer-term outcome will be the faster achievement of more environmentally friendly energy technologies which has an immeasurably large impact and benefit for society.

https://comp-h2o-split.eu/

PROfiling the atmospheric Boundary layer at European scale

CHAIR: Dr Martial Haeffelin (FR) martial.haeffelin@ipsl.fr
FUNDING PERIOD: October 2019 – April 2024

SUMMARY

The atmospheric boundary layer (ABL) is the layer closest to the Earth's surface within which most human activities take place. The vertical profile of atmospheric thermodynamic parameters in the ABL impact weather, air quality, and climate. Surface sensor networks and satellite observations do not provide sufficient information on the high temporal variability and strong vertical gradients experienced in the ABL. Thus, despite its importance, ABL remains the single most important under-sampled part of the atmosphere. This observational gap currently hampers our ability to improve weather forecasts, air quality prediction, and climate model parameterization. However, this gap is mainly due to the lack of S&T networking and coordination. In fact, state-of-the-art ground-based remote sensing instruments able to provide ABL profiles (such as temperature, humidity, wind, aerosol, cloud) are currently deployed at numerous sites in Europe, but the harmonization of data and procedures is missing, limiting the effective use and societal benefits of the existing ABL profiling data. This Action aims to fill this gap, bridging user needs and the S&T expertise residing in industry and academia. This will be achieved through:

- Capacity building of instrument operators to improve the use of state-of-the-art ABL profiling instruments;
- Fostering coordination between operational agencies and academia to tailor measurement networks for well identified applications;
- Enhancing pan-European research coordination to develop new products and tools for data assimilation and long-time series reanalysis;
- Identifying knowledge brokers enabling rapid exchange between academia, operational agencies, industry and end-users to ensure full exploitation for societal benefit.

http://www.probe-cost.eu/

Multi-disciplinary innovation for social change

CHAIR: Dr Katri-Liis Lepik (EE) kllepik@tlu.ee

FUNDING PERIOD: October 2019 – April 2024

SUMMARY

In an increasingly complex and rapidly changing world, traditional disciplinary approaches to the framing and resolution of social and economic problems deliver ever diminishing returns. Discussions abound, therefore, about how best to educate and prepare graduates for the fresh challenges of the 21st century. Knowledge Alliances between Higher Education Institutions (HEIs) and enterprises which aim to foster innovation, entrepreneurship, creativity, employability, knowledge exchange and/or multidisciplinary teaching and learning are therefore becoming increasingly necessary and relevant. The challenge is to determine what we should teach in the future and how it should be taught. The changing nature of contemporary society highlights that social issues are often highly complex and multifaceted. The aim of this Action is to demonstrate, through the adoption of Multi-Disciplinary Innovation (MDI) methods, how we can respond to social problems with a design-led approach which has a problem-oriented ethos, supporting positive social change and the development of international public policy discourse. It will be achieved through the establishment of a Pan-European Public Sector Innovation (ePSI) lab. It will prepare students for roles in employment by integrating education programmes into the lab's operations and it will support agencies that have a role in responding to and developing public policy.

https://socialchangelab.eu/

European Soil-Biology Data Warehouse for Soil Protection

CHAIR: Dr David Russell (DE) david.russell@senckenberg.de
FUNDING PERIOD: September 2019 – March 2024

SUMMARY

European authorities and stakeholders urgently need reliable tools for monitoring and evaluating the environmental condition of soils within policy assessment in context of numerous EU directives. The focus of the EUdaphobase Action is on creating the structures and procedures necessary for developing an open Europe-wide soil biodiversity data infrastructure. The ultimate goal of EUdaphobase is to establish a pan-European soil-biological data and knowledge warehouse, which can be used for understanding, protecting and sustainably managing soils, their biodiversity and functions. A focal approach is to combine available soil bioita's distributional & trait data with indispensable environmental metadata to gain insight into functional relationships in soils and to predict the state of ecosystem services (ESS). The activities follow an information flow from data providers to users of assessment tools. The data warehouse will host and allow open sharing of data. Intermediate in the project is developing standardized terminologies, data quality-control protocols and ecological traits used as proxies for soil ESS. The Action will curate, harmonize, quality check and standardize existing data according to protocols agreed upon during the Action. Innovative procedures to operationalize assessments of the state of soil concerning biodiversity and ESS will be offered. For this, specific analytical tools will be developed for applied uses of policy, management and regulatory agencies. These tools will recognize and visualize (i.e. on maps) functional biological characteristics of soils related to type, use and management practices as well as determine and delineate ecosystem services, baselines, relationships and set the basis for forecasting changes.

https://eudaphobase.eu

European transdisciplinary networking platform for marine biotechnology

CHAIR: Dr Ana Rotter (SI) ana.rotter@nib.si

FUNDING PERIOD: October 2019 – April 2024

SUMMARY

Marine organisms produce a vast diversity of primary and secondary metabolites with antibacterial, antifungal, anticancer, analgesic, anti-inflammatory, nutritional, photoprotective activity or other beneficial properties. The exploitation of marine bioresources and the valorisation of their natural products are encompassed by the burgeoning field of marine biotechnology, which is a high priority for the successful implementation of Blue Growth and Bioeconomy strategies within the EU. Marine biotechnology contributes to achieving 14 out of 17 UN sustainable development goals. While the demand for alternative sources of food, drugs and chemicals is increasing, the sea and its vast biota remain largely underexplored and unexploited. Despite the short history marine organisms delivered close to 30,000 natural products, many more awaiting to be discovered. This implies a strong need for enhanced transdisciplinary collaborations within scientific fields and multisectoral collaboration where citizens, researchers, policy makers, industrial and societal actors can work together. The overall aim of Ocean4Biotech is to bring together experts in the field of marine biotechnology, to provide a platform for sharing experience, knowledge and technologies, and to design a roadmap for a more efficient and rapid development of marine biotechnology research in Europe and beyond. To best of our knowledge, such a large, diverse and geographically dispersed network of experts in marine biotechnology does not exist. Since marine biotechnology is still in its infancy, we believe this is the optimal timing to create this efficient, operational, motivated, inclusive and sustainable network with a serious and ambitious commitment for proactive dissemination and science communication activities.

https://www.ocean4biotech.eu

Conservation of freshwater mussels: a pan-European approach

CHAIR: Prof. Tadeusz Zając (PL) tzajac@iop.krakow.pl
FUNDING PERIOD: October 2019 – April 2024

SUMMARY

Freshwater bivalves are a large, diverse and important group, since they can dominate in some habitats in terms of quantity and biomass. At the same time they are among the World's most imperilled taxonomic groups. Studies on freshwater bivalves' ecology and conservation provide the ground for inter- and trans-disciplinary research and innovation, integrating knowledge into practice of freshwater protection. Freshwater bivalves provide crucial ecosystem functions and services such as water purification or nutrient cycling, thus can be used as nature-based tools for improving ecosystem functions and services as well as indicators of ecosystem health. Through development of international cooperation of scientists from various fields within and outside biological sciences, with participation of administration and NGO sector, we want to draw the full picture of freshwater mussels biodiversity crisis in Europe and develop scientific basis to halt the loss of biodiversity and ecosystem services mediated by these organisms.

https://confremus.eu/

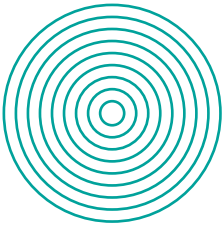
ADHEsion GPCR Network: Research and Implementation Set the path for future Exploration

CHAIR: Dr Simone Prömel (DE) proemel@hhu.de
FUNDING PERIOD: November 2019 – May 2024

SUMMARY

This Action aims to promote, stimulate and translate research on Adhesion-G protein-coupled receptors (aGPCRs) 'from bench to bedside' in Europe. Adhesion-GPCRs are a class of structurally and functionally highly intriguing cell surface receptors with essential functions in health and disease, which have remained understudied for a long time and thus, display a vastly unexploited pharmacological potential. Only the past years have seen an increase in efforts to unravel the mysteries of this enigmatic family of GPCRs. Scientists as well as clinicians from different fields with divergent expertise and interests begin to recognise the relevance of aGPCRs and get involved into aspects of aGPCR research. As a consequence, the community is young, only just forming and not well organised. The Action will assemble this community to increase the awareness of fellow scientist and the interaction between them so that their separate efforts and methods can be complemented. Especially Early Career Investigators (ECIs) who represent a great proportion of the community but most of the time lack the means to interact, will be encouraged and integrated to ensure the development of novel ideas and the long-term progress of the field. To achieve this goal the Action will establish a network of dedicated non-tenured ECIs, clinicians and representatives of pharmaceutical companies, provide communication platforms and opportunities to interact. This will lead to a more focused approach to tackle the most pressing scientific questions in the field and will help bridging the gap between fundamental research and therapeutic innovation.

https://www.adhernrise.eu/



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