EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Selected COST Action proposals for CSO approval

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CA21101
CONFINED MOLECULAR SYSTEMS: FROM A NEW GENERATION OF MATERIALS TO THE STARS

(OC-2021-1-25045 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Atomic, molecular and chemical physics • Materials engineering: Characterization methods of materials for material engineering applications • Chemical sciences: Physical chemistry • Chemical sciences: Surface science • Physical Sciences: Astrophysics, astronomy, space sciences	• CONFINED MOLECULAR SYSTEMS • METAL CLUSTERS • HELIUM NANODROPLETS • QUANTUM EFFECTS • ASTROCHEMISTRY

COST Countries

Main Proposer: ES

Network of Proposers: AT, BA, BE, BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IT, LT, LU, NL, PL, RO, RS, SE, SK, TR, UK

Main and secondary proposers: 5% ECI / 33% Women / 50% ITC

International Cooperation

International Partner Country: Argentina, China, India, Mexico, United States

European RTD Organisation: Portugal

Industrial Dimension

SMEs: GERMANY, NETHERLANDS, SPAIN, SWITZERLAND

CA21102
Toolkit of Care
(OC-2021-1-25061 - rank: 61 - mark: 44)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Arts: Visual arts • Arts: Performing arts	• creative technologies • critical technologies • post-pandemic support • critical art • toolkit of care

COST Countries

Main Proposer: CY
Network of Proposers: BG, CY, EL, FR, HR, LT, RO, RS, SE, UK
Main and secondary proposers: 13% ECI / 50% Women / 60% ITC

International Cooperation

International Partner Country: United States

CA21103
Implementation of Circular Economy in the Built Environment
(OC-2021-1-25108 - rank: 2 - mark: 49)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Civil engineering: Sustainable engineering, adaptation to long-term environmental changes • Civil engineering: Architecture engineering • Other engineering and technologies: Sustainability for other engineering and technologies	• Circular Economy • Buildings • Real Estate • Built Environment • Sustainable Development Goals

COST Countries

Main Proposer: PT
Network of Proposers: AT, BA, BE, BG, CH, CY, CZ, DE, EL, ES, FI, HR, IE, IT, LV, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, TR, UK
Main and secondary proposers: 11% ECI / 49% Women / 53% ITC

International Cooperation
European RTD Organisation: Belgium

Industrial Dimension
SMEs: BELGIUM, BULGARIA, GERMANY, NETHERLANDS, NORWAY, PORTUGAL, SPAIN

Large companies: CZECH REPUBLIC, GREECE, MONTENEGRO, NETHERLANDS, UNITED KINGDOM

CA21104
Pan-European Network for Sustainable Hydropower
(OC-2021-1-25114 - rank: 2 - mark: 49)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Mechanical engineering: Applied mechanics, thermodynamics • Electrical engineering, electronic engineering, Information engineering: Energy aspects of electrical and electronic engineering • Civil engineering: Sustainable engineering, adaptation to long-term environmental changes • Economics and business: Sustainability • Earth and related Environmental sciences: Hydrology, water resources	• HYDROPOWER • CLEAN ENERGY TRANSITION • SUSTAINABILITY • LOW-CARBON ECONOMY • CAPACITY BUILDING

COST Countries

Main Proposer: AT
Network of Proposers: AL, AT, BE, BG, CH, CZ, DE, EE, EL, ES, FR, HR, IS, IT, LT, LV, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, TR
Main and secondary proposers: 17% ECI / 33% Women / 57% ITC

International Cooperation

International Partner Country: Canada, India, Nepal

Industrial Dimension

SMEs: BELGIUM, CANADA, CROATIA, MALTA
Large companies: CANADA

CA21105
Blastocystis under One Health
(OC-2021-1-25116 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Parasitology • Biological sciences: Biodiversity, comparative biology • Health Sciences: Epidemiology • Biological sciences: Systems evolution, biological adaptation, phylogenetics, systematics • Biological sciences: Genomics, comparative genomics, functional genomics	• Blastocystis in health and disease • Blastocystis epidemiology • Blastocystis diversity and evolution • One Health approach • Blastocystis in 'omics era

COST Countries

Main Proposer: UK
Network of Proposers: BE, CY, CZ, DK, EL, ES, FR, HR, HU, IE, IT, LT, LV, MK, NO, PL, RO, RS, SI, TR, UK
Main and secondary proposers: 22% ECI / 48% Women / 57% ITC

International Cooperation

International Partner Country: Canada, Colombia, Japan, Peru, Saudi Arabia, Singapore, Thailand, United States

CA21106
COSMIC WISPers in the Dark Universe: Theory, astrophysics and experiments

(OC-2021-1-25120 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Particle physics (theory) • Physical Sciences: Fundamental interactions and fields (theory) • Physical Sciences: High energy and particles astronomy, X-rays, cosmic rays, gamma rays, neutrinos	• axions and hidden photons theory • axion dark matters searches • axions and hidden photon astrophysics • axions and hidden photons experiments

COST Countries

Main Proposer: IT
Network of Proposers: AL, AT, BG, CH, CY, CZ, DE, DK, EE, ES, FR, HR, HU, IL, IT, MT, NL, NO, PL, PT, RO, SE, SI, TR, UK
Main and secondary proposers: 18% ECI / 29% Women / 52% ITC

International Cooperation

International Partner Country: Australia, Chile, China, Japan, South Korea, United States

Industrial Dimension

SMEs: ITALY

CA21107
Work inequalities in later life redefined by digitalization.
(OC-2021-1-25123 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Sociology: Ageing • Sociology: Social structure, inequalities, social mobility, social exclusion, income distribution, poverty • Sociology: Work and professions	• inequalities • later life • digitalisation • extended working life • gender

COST Countries

Main Proposer: CZ
Network of Proposers: AL, AT, BA, BE, BG, CY, CZ, DE, EE, EL, FI, IE, IS, LT, LU, LV, ME, MK, NL, PL, PT, RO, RS, SE, SK, TR
Main and secondary proposers: 24% ECI / 57% Women / 65% ITC

International Cooperation

International Partner Country: Chile

Industrial Dimension

SMEs: BOSNIA AND HERZEGOVINA

CA21108
European Network for Skin Engineering and Modeling
(OC-2021-1-25129 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Biological systems analysis, modelling and simulation • Basic medicine: Organ physiology • Industrial biotechnology: Biomaterials synthesis	• Skin • 3R principles • Skin models • In silico skin models • Skin bioprinting

COST Countries

Main Proposer: AT
Network of Proposers: AT, BE, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FR, HR, HU, IE, IL, IT, LT, LU, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, TR, UK
Main and secondary proposers: 15% ECI / 52% Women / 53% ITC

International Cooperation

International Partner Country: Brazil

Industrial Dimension

SMEs: AUSTRIA, BELGIUM, ESTONIA, FRANCE, GERMANY, HUNGARY, NORWAY, SWITZERLAND
Large companies: GERMANY, GREECE

CA21109
Cartan geometry, Lie, Integrable Systems, quantum group Theories for Applications
(OC-2021-1-25132 - rank: 6 - mark: 48)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Mathematics: Lie groups, Lie algebras • Mathematics: Geometry • Physical Sciences: Mathematical physics	• Lie Theory • Cartan Geometry • Quantum Groups • Integrable Systems • Vision

COST Countries

Main Proposer: IT
Network of Proposers: AT, BG, CH, CZ, DE, ES, FR, HR, IT, ME, NL, NO, PL, PT, RO, RS, SI, SK, TR, UK
Main and secondary proposers: 13% ECI / 28% Women / 55% ITC

International Cooperation

International Partner Country: New Zealand, United States

Industrial Dimension

SMEs: UNITED STATES

Large companies: FRANCE, ITALY

CA21110
Building an open European Network on OsteoArthritis research
(OC-2021-1-25136 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Health Sciences: Health services, health care research	• OsteoArthritis • Health Sciences • Translational research • Patient driven

COST Countries

Main Proposer: NL
Network of Proposers: BE, BG, CH, CY, DE, ES, FI, FR, HU, LT, NL, PT, RO, RS, SE, SI, TR
Main and secondary proposers: 7% ECI / 48% Women / 52% ITC

International Cooperation

International Partner Country: Australia, United States

Industrial Dimension

SMEs: BELGIUM, SLOVENIA

CA21111
One Health drugs against parasitic vector borne diseases in Europe and beyond

(OC-2021-1-25163 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Chemical engineering: Medicinal chemistry, drug synthesis • Health Sciences: Parasitology • Biological sciences: Molecular biology and interactions	• Drug discovery • human and animal diseases • vector borne parasitic diseases • One Health approach • Integrated approach

COST Countries

Main Proposer: IT

Network of Proposers: BE, CH, CZ, DE, EL, ES, FI, FR, HR, HU, IL, IT, LV, MK, MT, NL, PL, PT, RS, SE, SI, SK, TR, UK

Main and secondary proposers: 14% ECI / 50% Women / 50% ITC

International Cooperation

International Partner Country: Brazil, Cameroon, Canada, Saudi Arabia, Trinidad and Tobago

European RTD Organisation: Germany

Industrial Dimension

SMEs: EGYPT, KOSOVO*, SWITZERLAND

Large companies: GERMANY

CA21112
Offshore freshened groundwater: An unconventional water resource in coastal regions?
(OC-2021-1-25171 - rank: 61 - mark: 42)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Earth and related Environmental sciences: Hydrology, water resources • Earth and related Environmental sciences: Geological oceanography • Earth and related Environmental sciences: Databases, data mining, data curation, computational modelling • Environmental engineering: Exploration and exploitation of crustal resources (water, oil, natural gas) • Environmental engineering: Water management and technology	• offshore freshened groundwater • unconventional water resource • resource assessment • sustainable management • environmental impact

COST Countries
Main Proposer: MT

Network of Proposers: AL, CZ, DE, EL, ES, FR, HR, IL, IT, LT, MT, NL, NO, PL, PT, RO, TR, UK

Main and secondary proposers: 27% ECI / 51% Women / 50% ITC

International Cooperation
International Partner Country: Brazil, Canada, China, Colombia, New Zealand, United States

Industrial Dimension
SMEs: CANADA, FRANCE, GREECE, ITALY, NETHERLANDS, NORWAY, SPAIN, UNITED KINGDOM, UNITED STATES

CA21113
Genome Editing to Treat Humans Diseases
(OC-2021-1-25175 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Medical biotechnology: Gene therapy, stem cell therapy, regenerative medicine for medical biotechnology	• Genome editing • ATMPs • zinc finger nuclease • TALEN • CRISPR/Cas9

COST Countries

Main Proposer: ES
Network of Proposers: CY, DE, DK, ES, FR, HR, IL, IT, LT, LU, NL, PL, RO, SI, TR, UK
Main and secondary proposers: 20% ECI / 46% Women / 50% ITC

International Cooperation

International Partner Country: Qatar

Industrial Dimension

SMEs: FRANCE, LITHUANIA

CA21114
CLIL Network for Languages in Education: Towards bi- and multilingual disciplinary literacies
(OC-2021-1-25206 - rank: 40 - mark: 43)

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

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Languages and literature: Second language teaching and learning • Educational sciences: Education: training, pedagogy, didactics	• Content and Language Integrated Learning • Language Education • Subject Education • Disciplinary Literacy • Teacher Education and Development

COST Countries

Main Proposer: AT
Network of Proposers: AT, CZ, DE, ES, FI, HU, IT, LU, NL, NO, PL, PT, RS, SE, SK, TR
Main and secondary proposers: 22% ECI / 85% Women / 50% ITC

International Cooperation

International Partner Country: Canada, Hong Kong SAR

CA21115
Iron-sulphur (FeS) clusters: from chemistry to immunology
(OC-2021-1-25209 - rank: 6 - mark: 48)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Biochemistry • Biological sciences: Molecular biology and interactions • Biological sciences: Metabolomics • Biological sciences: Virology	• FeS biogenesis • FeS enzymes • Immune response • Spectroscopy • Metabolomics and proteomics

COST Countries

Main Proposer: UK
Network of Proposers: CZ, DE, EL, FR, HU, IT, NL, PL, PT, RO, RS, SI, UK
Main and secondary proposers: 6% ECI / 50% Women / 53% ITC

CA21116
Identification of biological markers for prevention and translational medicine in pancreatic cancer
(OC-2021-1-25216 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Health Sciences: Epidemiology	• Pancreatic cancer • Biomarkers • Genetic susceptibility • Prevention • Early detection

COST Countries

Main Proposer: DE
Network of Proposers: BE, CZ, DE, DK, EE, EL, ES, HR, HU, IE, IT, LT, LV, NL, PL, PT, RO, RS, SK, TR, UK
Main and secondary proposers: 23% ECI / 45% Women / 57% ITC

International Cooperation

International Partner Country: Brazil, China, Japan

Industrial Dimension

SMEs: ITALY

CA21117
The role of IMMUnity in tackling PARKinson's disease through a Translational NETwork

(OC-2021-1-25227 - rank: 40 - mark: 44)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Neurological disorders (e.g. Alzheimer's disease, Huntington's disease, Parkinson's disease) • Clinical medicine: Adaptive immunity • Clinical medicine: Clinical neurology • Basic medicine: Neuroanatomy and neurophysiology	• Parkinson's disease • Immunity • Translational medicine • Neurodegenerative disease • Neuroimmunology

COST Countries

Main Proposer: IT
Network of Proposers: CZ, DE, DK, ES, FR, HR, HU, IT, LT, LU, LV, MT, PT, RO, RS, TR, UK
Main and secondary proposers: 22% ECI / 57% Women / 64% ITC

International Cooperation

International Partner Country: Chile, Singapore, United States

CA21118
Platform Work Inclusion Living Lab
(OC-2021-1-25232 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Economics and business: Labour economics • Law: Labour law • Sociology: Work and professions • Computer and Information Sciences: Machine learning algorithms • Political Science: Public administration, public policy	• Platform Work • Platform Economy • Intersectional gender approach • Digital technologies • Policy recommendations

COST Countries
Main Proposer: ES

Network of Proposers: AL, AT, BA, BE, BG, CH, CY, CZ, DE, EE, EL, ES, FR, HR, HU, IE, IT, NL, NO, PL, PT, RS, SI, TR, UK

Main and secondary proposers: 33% ECI / 58% Women / 52% ITC

International Cooperation
International Partner Country: Argentina, Brazil, Canada, Chile, United States

Industrial Dimension
SMEs: BELGIUM, CYPRUS, ITALY, UNITED KINGDOM
Large companies: UNITED STATES

CA21119
International network for harmonization of atmospheric aerosol retrievals from ground based photometers
(OC-2021-1-25237 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Earth and related Environmental sciences: Meteorology, atmospheric physics and dynamics	• Atmospheric physics • aerosols • photometry

COST Countries

Main Proposer: CH

Network of Proposers: AT, BE, BG, CH, CY, CZ, DE, EE, EL, ES, FI, FR, HU, IS, IT, LT, MT, NL, PL, PT, RO, RS, SE, SK, TR, UK

Main and secondary proposers: 22% ECI / 34% Women / 50% ITC

International Cooperation

International Partner Country: Australia, Brazil, Canada, China, Kuwait, South Korea
European RTD Organisation: Greece

Industrial Dimension

SMEs: AUSTRIA, CANADA, FRANCE, GREECE
Large companies: NETHERLANDS

CA21120
History of Identity Documentation in European Nations: Citizenship, Nationality and Migration
(OC-2021-1-25254 - rank: 24 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Law: International law • History and Archeology: Colonial and post-colonial history, global and transnational history • Sociology: Anthropology, ethnology, cultural studies • Sociology: Migration, interethnic relations • History and Archeology: Modern and contemporary history	• Identity documentation • Passports • Citizenship • Nationality • Migration

COST Countries

Main Proposer: IE
Network of Proposers: CY, CZ, DE, EE, ES, HR, HU, IE, MT, PT, RO, RS, UK
Main and secondary proposers: 52% ECI / 26% Women / 69% ITC

CA21121
European network for the Mechanics of Matter at the Nano- scale
(OC-2021-1-25277 - rank: 66 - mark: 44)

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 nano-scale, 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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Materials engineering: • Characterization methods of materials for material engineering applications • Materials engineering: Mechanical and acoustical properties of condensed matter for materials engineering applications • Nano-technology: Nano-materials and nano-structures • Nano-technology: Metrology and measurement for nano-technology applications	• micromechanical / nanomechanical testing • materials science & engineering • nanocharacterization • nanomaterials

COST Countries

Main Proposer: DE
Network of Proposers: AT, BE, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IL, IT, LT, LU, LV, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, UK
Main and secondary proposers: 34% ECI / 36% Women / 50% ITC

Industrial Dimension

SMEs: SWITZERLAND
Large companies: FRANCE

CA21122
PROmoting GeRiAtric Medicine IN countries where it is still eMerGing
(OC-2021-1-25280 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Geriatrics and gerontology • Educational sciences: Education: training, pedagogy, didactics	• Geriatric Medicine • Professional Education • Older people • Health care

COST Countries

Main Proposer: EL
Network of Proposers: AT, BE, BG, CH, CY, CZ, DE, EE, EL, ES, FR, HR, IT, LT, LU, MK, MT, NO, PL, PT, RO, RS, TR, UK
Main and secondary proposers: 25% ECI / 65% Women / 58% ITC

Industrial Dimension

SMEs: CYPRUS

CA21123
Cancer- Understanding Prevention in Intellectual Disabilities
(OC-2021-1-25290 - rank: 6 - mark: 48)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Health Sciences: Health services, health care research • Sociology: Social structure, inequalities, social mobility, social exclusion, income distribution, poverty	• Cancer • Screening • Intellectual Disabilities • Prevention • Adults

COST Countries

Main Proposer: IE
Network of Proposers: BA, BE, BG, CH, CY, CZ, DE, EL, HR, HU, IE, IT, LT, LV, MK, NL, PL, PT, RO, RS, SI, SK, TR, UK
Main and secondary proposers: 31% ECI / 54% Women / 66% ITC

International Cooperation

International Partner Country: United States

CA21124
LIFT: Lifting farm animal lives – laying the foundations for positive animal welfare

(OC-2021-1-25303 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Animal and dairy science: Ethics of animal and dairy science	• Positive welfare • farm animals • affective states • methodologies • welfare assessment

COST Countries

Main Proposer: DK
Network of Proposers: AL, AT, BE, CZ, DE, DK, EE, ES, FR, HR, HU, IT, LT, LV, MK, NL, NO, PL, PT, SE, SI, TR, UK
Main and secondary proposers: 23% ECI / 59% Women / 52% ITC

International Cooperation

International Partner Country: New Zealand, United States

Industrial Dimension

SMEs: DENMARK
Large companies: PORTUGAL

CA21125
A European forum for revitalisation of marginalised mountain areas
(OC-2021-1-25312 - rank: 68 - mark: 42)

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 taskgroups (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 postmarginalized 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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Political Science: Political systems and institutions, governance • Earth and related Environmental sciences: Terrestrial ecology, land cover change • Social and economic geography: Spatial development, land use, regional planning • Economics and business: Microeconomics, institutional economics	• Social-ecological traps • territorial cooperation • Social innovation • Environment governance • transformation pathways

COST Countries

Main Proposer: FI
Network of Proposers: AT, BA, BG, CH, CZ, DE, EL, ES, FI, FR, HR, HU, IS, IT, LT, MK, NL, NO, PL, PT, RO, RS, SI, SK, UK
Main and secondary proposers: 28% ECI / 51% Women / 52% ITC

Industrial Dimension

SMEs: HUNGARY

CA21126
Carbon molecular nanostructures in space
(OC-2021-1-25323 - rank: 68 - mark: 44)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Astrophysics, astronomy, space sciences • Physical Sciences: Interstellar medium • Physical Sciences: Atomic, molecular and chemical physics • Chemical sciences: Spectroscopic and spectrometric techniques • Chemical sciences: Theoretical and computational chemistry	• Carbon nanostructures • Astrochemistry • Theoretical/computational molecular chemistry/physics • Interstellar and circumstellar chemistry • Observational astronomy

COST Countries

Main Proposer: ES

Network of Proposers: AL, AT, BA, BE, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IS, IT, LT, LU, LV, MD, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, TR, UK

Main and secondary proposers: 26% ECI / 36% Women / 57% ITC

International Cooperation

International Partner Country: Canada, China, Hong Kong SAR, Japan, United States

Industrial Dimension

SMEs: FRANCE, ITALY, NETHERLANDS, UNITED STATES

Large companies: GERMANY, RUSSIAN FEDERATION, UNITED KINGDOM

CA21127
Techno-economic analysis of carbon mitigation technologies
(OC-2021-1-25331 - rank: 40 - mark: 45)

SUMMARY
TrANsMIT proposes a COST Action on the techno-economic analysis (TEA) of the overall, integrated CO2 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. CO2 capture from air, CO2 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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Environmental engineering: Engineering of energy production and energy systems, energy distribution and application • Environmental engineering: Energy and fuels • Chemical engineering: Chemical engineering: processes and products (others) • Chemical engineering: Sustainable engineering • Environmental engineering: Environmental and geological engineering	• CO2 capture, utilization and storage • negative emission technologies and direct air capture • economic system analysis • process modelling and analysis • climate neutrality

COST Countries
Main Proposer: PL
Network of Proposers: CH, CZ, EE, ES, HR, IT, NL, NO, PL, PT, RO, RS, SE, TR, UK
Main and secondary proposers: 52% ECI / 50% Women / 53% ITC

International Cooperation
International Partner Country: Mexico

Industrial Dimension
SMEs: NETHERLANDS, SWEDEN, UNITED KINGDOM
Large companies: CZECH REPUBLIC, POLAND, SERBIA, SPAIN

CA21128
PROton BOron Nuclear fusion: from energy production to medical applicatiOns

(OC-2021-1-25332 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Lasers, ultra-short lasers and laser physics • Physical Sciences: Gas and plasma physics (theory) • Physical Sciences: Nuclear physics (theory) • Physical Sciences: General physics	• alpha-particle generation • proton-boron fusion • energy production • radioisotope production • development of high-brightness a-particle sources

COST Countries

Main Proposer: PL
Network of Proposers: BG, CZ, DE, EL, ES, FR, HU, IL, IT, PL, PT, RO, RS, SI, UK
Main and secondary proposers: 14% ECI / 26% Women / 53% ITC

International Cooperation

International Partner Country: Australia, Canada, China, India, Japan, United States

Industrial Dimension

SMEs: AUSTRALIA, SLOVENIA, UKRAINE, UNITED STATES

CA21129
What are Opinions? Integrating Theory and Methods for Automatically Analyzing Opinionated Communication
(OC-2021-1-25345 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Media and communications: Media and communications, social aspects of information science and surveillance, socio-cultural communication • Media and communications: Databases, data mining, data curation, computational modelling • Other social sciences: Quantitative methods for the social sciences	• opinion • textual analyis • computational methods • evaluative text

COST Countries

Main Proposer: IL

Network of Proposers: AL, AT, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FR, HR, HU, IE, IL, IT, LT, LU, MK, NL, NO, PL, PT, RO, RS, SE, SI, SK, TR, UK

Main and secondary proposers: 38% ECI / 59% Women / 54% ITC

International Cooperation

International Partner Country: United States

Industrial Dimension

Large companies: GERMANY

CA21130
P2X receptors as a therapeutic opportunity
(OC-2021-1-25354 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Basic medicine: Cell signalling and cellular interactions • Basic medicine: Pharmacology, pharmacogenomics, drug discovery and design, drug therapy • Clinical medicine: Biological basis of immunity related disorders • Basic medicine: Neurochemistry and neuropharmacology • Biological sciences: Biochemistry of signal transduction	• extracellular ATP and P2X receptors • Ion channel • inflammation • neurotransmission • cancer

COST Countries
Main Proposer: IT
Network of Proposers: BG, CH, CZ, DE, DK, EE, ES, FI, FR, HU, IE, IT, PL, PT, RO, RS, SI, SK, TR, UK
Main and secondary proposers: 12% ECI / 50% Women / 55% ITC

International Cooperation
International Partner Country: Brazil

Industrial Dimension
SMEs: GERMANY, ITALY

CA21131
Enabling multilingual eye-tracking data collection for human and machine language processing research
(OC-2021-1-25359 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Languages and literature: Databases, data mining, data curation, computational modelling • Psychology: Psycholinguistics: acquisition and knowledge of language, language pathologies • Computer and Information Sciences: Machine learning algorithms	• eye tracking • natural language processing • multilingual • psycholinguistics • low resource languages

COST Countries

Main Proposer: DK
Network of Proposers: AL, CH, CY, CZ, DE, DK, EE, ES, HR, IL, LT, LV, MK, MT, NL, PL, PT, RO, RS, SE, SI, TR, UK
Main and secondary proposers: 26% ECI / 36% Women / 57% ITC

International Cooperation

International Partner Country: Canada, United States

CA21132
European Swine Influenza Network
(OC-2021-1-25360 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Veterinary science: Veterinary medicine (miscellaneous) • Biological sciences: Virology • Health Sciences: Infectious diseases • Animal and dairy science: Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide) • Animal and dairy science: Agriculture related to animal husbandry, dairying, livestock raising, animal welfare	• Swine Influenza A virus • OneHealth • Animal health • Sustainable pig production • Zoonotic infection

COST Countries

Main Proposer: FR

Network of Proposers: AL, AT, BA, BE, BG, CZ, DE, DK, ES, FR, HR, HU, IE, IT, ME, MK, NL, NO, PL, PT, RO, RS, SE, SI, SK, UK

Main and secondary proposers: 29% ECI / 56% Women / 53% ITC

Industrial Dimension

SMEs: PORTUGAL

Large companies: FRANCE, NETHERLANDS

CA21133
Globalization, Illicit Trade, Sustainability and Security
(OC-2021-1-25361 - rank: 68 - mark: 44)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Political Science: Political systems and institutions, governance • Law: Criminal law	• Illicit Trade • Security • Sustainability • Safety

COST Countries

Main Proposer: NL
Network of Proposers: AL, AT, BA, BE, BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HR, IE, IS, IT, LT, LV, MD, ME, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, UK
Main and secondary proposers: 24% ECI / 36% Women / 52% ITC

International Cooperation

International Partner Country: United States

CA21134
Towards zer0 Pesticide AGRIculture : European Network for sustainability

(OC-2021-1-25363 - rank: 2 - mark: 49)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Agriculture, Forestry, and Fisheries: Agriculture related to crop production, soil biology and cultivation, applied plant biology, crop protection • Agriculture, Forestry, and Fisheries: Sustainable Agriculture • Agriculture, Forestry, and Fisheries: Biodiversity, comparative biology	• chemical pesticides • agroecology • sustainable agriculture • crop protection • transition

COST Countries

Main Proposer: FR
Network of Proposers: BE, BG, CH, CZ, DE, DK, EL, FR, HR, HU, IT, LT, LV, PL, PT, RO, SE, SK
Main and secondary proposers: 25% ECI / 46% Women / 55% ITC

International Cooperation

International Partner Country: Argentina, Chile

Industrial Dimension

SMEs: FRANCE, GERMANY

CA21135
Modelling immunotherapy response and toxicity in cancer
(OC-2021-1-25372 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Oncology • Medical biotechnology: Medical biotechnology, other • Basic medicine: Adaptive immunity	• cancer • immunotherapy • preclinical models • toxicity • biomarkers

COST Countries

Main Proposer: ES
Network of Proposers: AT, DE, ES, HR, HU, IT, LV, MT, NL, PL, PT, RO, SI, UK
Main and secondary proposers: 20% ECI / 45% Women / 57% ITC

International Cooperation

International Partner Country: United States

Industrial Dimension

SMEs: GERMANY, SPAIN, UNITED KINGDOM

CA21136
Addressing observational tensions in cosmology with systematics and fundamental physics
(OC-2021-1-25377 - rank: 61 - mark: 43)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Cosmology • Physical Sciences: Dark matter, dark energy • Physical Sciences: Astrophysics, astronomy, space sciences	• Cosmological surveys • Observation systematics • Gravitation • Fundamental physics • Dark Energy, Dark Matter

COST Countries

Main Proposer: MT
Network of Proposers: BA, BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IT, MT, PL, PT, RO, SE, TR, UK
Main and secondary proposers: 31% ECI / 50% Women / 50% ITC

International Cooperation

International Partner Country: Mexico, United States

CA21137
Ethics in Dementia
(OC-2021-1-25378 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Health Sciences: Medical ethics • Philosophy, Ethics and Religion: Ethics and morality, social ethics	• Dementia • Ethics • Autonomy • Dignity • Person centered care

COST Countries

Main Proposer: DK
Network of Proposers: AL, BE, CZ, DE, DK, EE, HU, IE, MT, NO, PL, RS
Main and secondary proposers: 22% ECI / 55% Women / 58% ITC

CA21138
Joint effects of CLimate Extremes and Atmospheric deposition on European FORESTs
(OC-2021-1-25393 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Earth and related Environmental sciences: Terrestrial ecology, land cover change • Earth and related Environmental sciences: Biogeochemistry, biogeochemical cycles • Agriculture, Forestry, and Fisheries: Biochemistry • Biological sciences: Plant biology, Botany • Earth and related Environmental sciences: Geochemistry, isotope geochemistry	• Forest functioning • Tree mortality • Manipulation experiments • Monitoring network • Global change driver interactions

COST Countries
Main Proposer: IT

Network of Proposers: AL, AT, BA, BE, BG, CH, CY, CZ, DE, EE, EL, ES, FI, FR, HU, IT, MD, NL, NO, PL, PT, RO, RS, SE, SI, SK, TR, UK

Main and secondary proposers: 12% ECI / 35% Women / 53% ITC

International Cooperation
International Partner Country: China, Costa Rica, United States
European RTD Organisation: Finland

Industrial Dimension
SMEs: GREECE, ITALY, PORTUGAL, SPAIN
Large companies: GREECE

CA21139
3Rs concepts to improve the quality of biomedical science
(OC-2021-1-25394 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Social and economic geography: Socio-economic aspects of individual sciences and technologies, excluding environmental sciences, agriculture and transport • Media and communications: Media and communications, social aspects of information science and surveillance, socio-cultural communication • Veterinary science: Veterinary medicine (miscellaneous) • Biological sciences: Ethics of biological sciences • Health Sciences: Social biomedical sciences (including family planning, sexual health, psycho-oncology, political and social effects of biomedical research)	• reproducbility crisis • predictability crisis • frameworks for research quality improvement • ethical, social, political aspects for quality improvement • Directive 63/2010/EU

COST Countries
Main Proposer: AT
Network of Proposers: AT, BA, BE, CH, CZ, DE, EE, ES, HR, HU, IE, IT, LT, LU, LV, NL, NO, PT, RO, SE, SK
Main and secondary proposers: 35% ECI / 65% Women / 52% ITC

Industrial Dimension
SMEs: BOSNIA AND HERZEGOVINA, CROATIA

CA21140
INTercEption of oRal CancEr develoPmenT
(OC-2021-1-25400 - rank: 40 - mark: 43)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Oncology • Clinical medicine: Databases, data mining, data curation, computational modelling • Health Sciences: Health services, health care research • Health Sciences: Social biomedical sciences (including family planning, sexual health, psycho-oncology, political and social effects of biomedical research) • Clinical medicine: Dentistry, oral surgery and medicine	• oral cancer • Prevention • Preneoplasia • Disease care Management • Oral leukoplakia and dysplasia

COST Countries
Main Proposer: FR

Network of Proposers: BE, CH, CY, CZ, DE, DK, EE, ES, FR, HR, HU, IE, IL, IT, LT, LU, LV, NL, PL, PT, SI, TR, UK

Main and secondary proposers: 12% ECI / 38% Women / 52% ITC

International Cooperation
International Partner Country: France

Industrial Dimension
SMEs: FRANCE, ITALY, NETHERLANDS, PORTUGAL
Large companies: LUXEMBOURG

CA21141
Grassroots of Digital Europe: from Historic to Contemporary Cultures of Creative Computing
(OC-2021-1-25404 - rank: 2 - mark: 48)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Media and communications: History and philosophy of media and communication	• grassroot movements • creative computing • digital cultural heritage

COST Countries

Main Proposer: FI
Network of Proposers: CH, CZ, DK, EE, ES, FI, IE, IT, LT, MT, PL, PT, RO, SK, TR, UK
Main and secondary proposers: 45% ECI / 35% Women / 56% ITC

International Cooperation

International Partner Country: Australia, India

CA21142
Fruit tree Crop REsponses to Water deficit and decision support Systems applications

(OC-2021-1-25411 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Agriculture, Forestry, and Fisheries: Sustainable Agriculture • Agriculture, Forestry, and Fisheries: Agriculture related to crop production, soil biology and cultivation, applied plant biology, crop protection	• Fruit crops • Water scarcity • Irrigation • Plant Physiology • Plant sensors

COST Countries

Main Proposer: IT
Network of Proposers: AL, BA, BE, CY, CZ, DE, EL, ES, FR, HU, IL, IT, NL, NO, PL, PT, RO, RS, SI, TR, UK
Main and secondary proposers: 24% ECI / 31% Women / 52% ITC

International Cooperation

International Partner Country: United States

Industrial Dimension

SMEs: GERMANY, ISRAEL, ITALY, NETHERLANDS, SERBIA, SPAIN, UNITED KINGDOM, UNITED STATES
Large companies: FRANCE, ISRAEL

CA21143
Transnational Family Dynamics in Europe
(OC-2021-1-25424 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Sociology: Family studies • Sociology: Migration, interethnic relations	• Transnational families • Family policies • Migration • European integration & inclusion • Social protection

COST Countries

Main Proposer: BE
Network of Proposers: BA, BE, BG, CH, CY, DE, HR, HU, IT, LT, LU, LV, NL, PL, PT, RO, RS, TR, UK
Main and secondary proposers: 35% ECI / 65% Women / 68% ITC

International Cooperation

International Partner Country: Australia, Brazil

CA21144
SUPERCONDUCTING NANODEVICES AND QUANTUM MATERIALS FOR COHERENT MANIPULATION

(OC-2021-1-25431 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Superconductivity (theory) • Physical Sciences: Nanophysics: nanoelectronics, nanophotonics, nanomagnetism or classify	• Superconductivity • Quantum devices • Quantum sensors • Strong electronic correlations • Magnetism

COST Countries

Main Proposer: ES
Network of Proposers: AT, BE, BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IL, IT, LV, MD, ME, NL, PL, PT, RO, RS, SE, SI, SK, TR, UK
Main and secondary proposers: 11% ECI / 26% Women / 51% ITC

Industrial Dimension

SMEs: GERMANY, ITALY

CA21145
European Network for diagnosis and treatment of antibiotic- resistant bacterial infections
(OC-2021-1-25433 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Glycomics • Basic medicine: Pharmacology, pharmacogenomics, drug discovery and design, drug therapy • Basic medicine: Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide) • Chemical sciences: Colloid chemistry, macromolecular chemistry, polymer chemistry • Chemical sciences: Databases, data mining, data curation, computational modelling	• drug resistant bacteria • infections • diagnosis • drug design and delivery • microbiology and microbiota

COST Countries
Main Proposer: IT
Network of Proposers: BG, CZ, DE, DK, FR, IS, IT, LU, LV, PT, RO, RS, TR, UK
Main and secondary proposers: 11% ECI / 66% Women / 57% ITC

Industrial Dimension
SMEs: DENMARK, UNITED KINGDOM

CA21146
Fundamentals and applications of purple bacteria biotechnology for resource recovery from waste
(OC-2021-1-25444 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Chemical engineering: Chemical engineering for waste management applications • Environmental engineering: Waste treatment (environmental engineering) • Environmental biotechnology: Bioreactors and applied microbiology for environmental engineering • Environmental engineering: Environmental impact, Life Cycle Assessment • Physical Sciences: Biophysics	• Purple phototrophic bacteria • Resource recovery from waste • Bioreactor design and processing • Bioeconomy and Circular Economy • Development of novel bioproducts

COST Countries
Main Proposer: ES

Network of Proposers: AL, AT, BE, BG, CH, CY, CZ, DE, EE, EL, ES, FR, HU, IT, NL, PL, PT, RS, SK, TR, UK

Main and secondary proposers: 27% ECI / 56% Women / 52% ITC

International Cooperation
International Partner Country: Australia, China, India, Mexico, United States

Industrial Dimension
SMEs: BELGIUM, NETHERLANDS, SPAIN, UNITED KINGDOM

Large companies: GREECE, SPAIN

CA21147
European Network on Optimising Treatment with Therapeutic Antibodies in chronic inflammatory diseases
(OC-2021-1-25445 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Health Sciences: Health services, health care research • Medical engineering: Databases, data mining, data curation, computational modelling • Clinical medicine: Rheumatology • Clinical medicine: Gastroenterology and hepatology • Clinical medicine: Dermatology and venereal diseases	• Inflammatory chronic diseases • Biopharmaceuticals • Cost-effectiveness • Drug monitoring • Precision medicine

COST Countries

Main Proposer: FR
Network of Proposers: BE, BG, EE, ES, FR, HU, LT, MK, NL, PT, RS, SE, SI
Main and secondary proposers: 33% ECI / 61% Women / 61% ITC

CA21148
Research and International Networking on Emerging Inorganic Chalcogenides for Photovoltaics

(OC-2021-1-25446 - rank: 1 - mark: 50)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Semiconductors, material growth, physical properties (theory) • Chemical sciences: Chemistry of condensed matter • Materials engineering: Semiconductors, material growth, physical properties for materials engineering applications • Materials engineering: Thin films • Materials engineering: New materials: oxides, alloys, composite, organic- inorganic hybrid	• Emerging inorganic chalcogenides • Green-earth-abundant elements • Low cost thin-film PV • Sustainable technology • Research excellence network

COST Countries

Main Proposer: EE

Network of Proposers: AT, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, IT, LT, LU, LV, MD, NO, PL, PT, RO, SE, SK, TR, UK

Main and secondary proposers: 21% ECI / 46% Women / 53% ITC

International Cooperation

International Partner Country: Australia, Brazil, China, Japan, Mexico, South Korea, United States, Uzbekistan

Industrial Dimension

SMEs: AUSTRIA, ESTONIA, FRANCE, GERMANY, GREECE, LITHUANIA, SLOVAKIA

CA21149
Reducing acrylamide exposure of consumers by a cereals supply-chain approach targeting asparagine
(OC-2021-1-25464 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Agriculture, Forestry, and Fisheries: Agriculture related to crop production, soil biology and cultivation, applied plant biology, crop protection • Health Sciences: Nutrition and dietetics • Economics and business: Consumer choice, behavioural economics • Economics and business: International trade	• Acrylamide • Asparagine • Cereals • Plant Breeding • Agronomy

COST Countries
Main Proposer: UK
Network of Proposers: AT, BE, CH, CZ, DE, ES, FR, HU, IE, IT, LT, LV, NL, PL, PT, RO, RS, SE, SI, SK, TR, UK
Main and secondary proposers: 15% ECI / 52% Women / 50% ITC

International Cooperation
International Partner Country: United States

Industrial Dimension
SMEs: CZECH REPUBLIC, UNITED KINGDOM
Large companies: FRANCE, GERMANY, NETHERLANDS, SWEDEN, SWITZERLAND, UNITED KINGDOM, UNITED STATES

CA21150
Parental Leave Policies and Social Sustainability
(OC-2021-1-25465 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Sociology: Social structure, inequalities, social mobility, social exclusion, income distribution, poverty • Political Science: Social policies, welfare state	• Paid Parental Leave • Social Sustainability • Inequalities • Early Childhood • Welfare State

COST Countries

Main Proposer: DE
Network of Proposers: AT, BG, CY, CZ, DE, EE, EL, ES, FI, HR, HU, IE, IL, LT, LU, NL, PL, PT, RS, SE, SK, UK
Main and secondary proposers: 15% ECI / 81% Women / 54% ITC

CA21151
GENERATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS FROM HAPLO-SELECTED CORD BLOOD SAMPLES

(OC-2021-1-25466 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Stem cell biology	• human induced Pluripotent Stem Cells (hiPSC) • Cord Blood samples • HLA homozygous haplotypes

COST Countries

Main Proposer: ES
Network of Proposers: BG, CZ, DE, ES, FR, HR, HU, IT, NL, NO, PL, PT, SE, SI, TR, UK
Main and secondary proposers: 16% ECI / 51% Women / 50% ITC

International Cooperation

European RTD Organisation: Germany

Industrial Dimension

SMEs: CZECH REPUBLIC, HUNGARY
Large companies: ITALY

CA21152
Implementation Network Europe for Cancer Survivorship Care
(OC-2021-1-25469 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Health Sciences: Health services, health care research • Clinical medicine: Oncology • Other engineering and technologies: Sustainability for other engineering and technologies	• cancer survivorship • implementation science • digital/electronic health solutions • sustainability • risk stratification

COST Countries

Main Proposer: IE
Network of Proposers: AL, BA, BE, BG, CH, EE, ES, FR, HR, IE, IT, LU, LV, PL, PT, RO, SE, SI, TR, UK
Main and secondary proposers: 35% ECI / 61% Women / 60% ITC

International Cooperation

International Partner Country: Australia, Hong Kong SAR, Malaysia, United States

Industrial Dimension

SMEs: ITALY, UNITED KINGDOM

CA21153
Network for implementing multiomics approaches in atherosclerotic cardiovascular disease prevention and research
(OC-2021-1-25477 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Cardiovascular diseases • Basic medicine: Genomics, comparative genomics, functional genomics • Basic medicine: Transcriptomics • Basic medicine: Proteomics • Computer and Information Sciences: Machine learning algorithms	• Atherosclrosic Cardiovascular Diseases • Systems biology • omics • Machine learning • Personalized medicine

COST Countries
Main Proposer: RS
Network of Proposers: AT, BA, BE, CY, DE, DK, EL, ES, HR, HU, IS, IT, LU, MT, NL, PL, PT, RO, RS, SI, TR, UK
Main and secondary proposers: 25% ECI / 52% Women / 54% ITC

International Cooperation
International Partner Country: Australia, Brazil, United States

Industrial Dimension
SMEs: AUSTRIA, SLOVENIA, SPAIN
Large companies: BOSNIA AND HERZEGOVINA

CA21154
Translational control in Cancer European Network
(OC-2021-1-25480 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Protein synthesis, modification and turnover • Biological sciences: RNA synthesis, processing, modification and degradation • Biological sciences: Proteomics	• Translational control • RNA biology - Therapeutic RNA • Cancer biology • Ribosome • Epitranscriptomics

COST Countries

Main Proposer: FR
Network of Proposers: BE, CZ, DE, DK, EE, EL, ES, FR, HR, IT, LT, ME, NL, PL, PT, RO, RS, SE, TR, UK
Main and secondary proposers: 19% ECI / 48% Women / 50% ITC

Industrial Dimension

SMEs: FRANCE, ITALY, NETHERLANDS, UNITED KINGDOM

Large companies: FRANCE, GERMANY, TURKEY

CA21155
Advanced Composites under HIgh STRAin raTEs loading: a route to certification-by-analysis
(OC-2021-1-25486 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Materials engineering: Characterization methods of materials for material engineering applications • Materials engineering: Structural properties of materials • Materials engineering: New materials: oxides, alloys, composite, organic- inorganic hybrid	• composites • high strain rate loading • certification • testing • modeling

COST Countries

Main Proposer: BE

Network of Proposers: AT, BA, BE, BG, CY, CZ, DE, DK, EE, EL, FR, HR, HU, IL, IT, LT, LU, LV, ME, NL, PL, PT, RO, RS, SE, SI, SK, TR, UK

Main and secondary proposers: 26% ECI / 27% Women / 62% ITC

International Cooperation

International Partner Country: Italy

Industrial Dimension

SMEs: ARMENIA, CYPRUS, GERMANY, GREECE, ITALY, LUXEMBOURG, SERBIA, SLOVENIA, UKRAINE

Large companies: BELGIUM, CZECH REPUBLIC, GERMANY, ISRAEL, NETHERLANDS

CA21156
european network for FOstering Large-scale ImplementAtion of energy GEostructure

(OC-2021-1-25489 - rank: 24 - mark: 45)

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, …).

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Civil engineering: Sustainable engineering, adaptation to long-term environmental changes	• Energy geostructures • large scale implementation • long term energy performance • Environmental Impact • Retrofitting

COST Countries

Main Proposer: FR
Network of Proposers: CH, CY, EL, ES, FR, IT, LT, MK, NL, NO, PL, PT, RO, RS, SE, SI, SK, UK
Main and secondary proposers: 24% ECI / 32% Women / 50% ITC

Industrial Dimension

SMEs: FRANCE, NETHERLANDS, ROMANIA
Large companies: FRANCE, ROMANIA

CA21157
European Network for Innovative Woody Plant Cloning
(OC-2021-1-25510 - rank: 6 - mark: 48)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Agricultural biotechnology: Biotechnology (non-medical) • Agriculture, Forestry, and Fisheries: Agriculture related to crop production, soil biology and cultivation, applied plant biology, crop protection	• Woody • shrub • biotechnology • somatic • micropropagation

COST Countries

Main Proposer: BE
Network of Proposers: AL, BE, BG, CZ, DE, ES, FI, FR, IT, LV, NO, PT, RS, SE, SK, TR
Main and secondary proposers: 7% ECI / 70% Women / 50% ITC

International Cooperation

International Partner Country: Argentina, New Zealand

European RTD Organisation: Luxembourg

CA21158
Enhancing Small-Medium IsLands resilience by securing the sustainability of Ecosystem Services
(OC-2021-1-25514 - rank: 61 - mark: 43)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Earth and related Environmental sciences: Terrestrial ecology, land cover change • Agriculture, Forestry, and Fisheries: Conservation biology, ecology, genetics • Social and economic geography: Spatial development, land use, regional planning	• . islands • 2. ecosystem services • 3. resilience • 4. landscapes • 5. seascapes

COST Countries

Main Proposer: CY
Network of Proposers: BG, CY, DE, DK, EE, EL, ES, HR, IL, IS, IT, LT, LV, MT, NO, PL, PT, RS, TR, UK
Main and secondary proposers: 15% ECI / 38% Women / 55% ITC

International Cooperation

International Partner Country: China, South Korea

Industrial Dimension

SMEs: MALTA, SERBIA

CA21159
Understanding interaction light - biological surfaces: possibility for new electronic materials and devices
(OC-2021-1-25524 - rank: 11 - mark: 47)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Materials engineering: Biomaterials, metals, ceramics, polymers, composites • Electrical engineering, electronic engineering, Information engineering: Micro-electronics, optoelectronics for electrical and electronic engineering	• photonics • biological surfaces • nanostructures • microstructures • biomimetics

COST Countries

Main Proposer: PL
Network of Proposers: AT, CH, DE, LU, LV, NL, PL, PT, SI, UK
Main and secondary proposers: 8% ECI / 25% Women / 50% ITC

CA21160
Non-globular proteins in the era of Machine Learning
(OC-2021-1-25529 - rank: 40 - mark: 44)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Structural biology (crystallography, NMR, EM) • Computer and Information Sciences: Machine learning algorithms • Biological sciences: Biophysics • Biological sciences: Bioinformatics • Biological sciences: Computational biology	• Structural Biology • Machine Learning • Computational Biology • Non-globular proteins

COST Countries

Main Proposer: IT
Network of Proposers: AL, AT, BA, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, IL, IS, IT, LT, LV, ME, NL, PL, PT, RS, SE, SI, SK, TR, UK
Main and secondary proposers: 64% ECI / 40% Women / 50% ITC

International Cooperation

International Partner Country: Argentina, India, Japan, United States

Industrial Dimension

Large companies: DENMARK

CA21161
A new ecosystem of early music studies
(OC-2021-1-25535 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Arts: Performing arts • Arts: Databases, data mining, data curation, computational modelling • Other humanities: Cultural heritage, cultural memory	• Musicology • Early music • Music education • Performance studies • Creative industries

COST Countries

Main Proposer: FR
Network of Proposers: AT, BE, BG, CH, CY, CZ, DE, EL, ES, FR, HR, HU, IT, LT, LV, NL, PL, PT, RS, SE, SI, SK, UK
Main and secondary proposers: 10% ECI / 40% Women / 52% ITC

International Cooperation

International Partner Country: United States

Industrial Dimension

SMEs: GERMANY

CA21162
Establishing a Pan-European Network on Computational Redesign of Enzymes

(OC-2021-1-25536 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Biochemistry • Industrial biotechnology: Biocatalysis • Biological sciences: Bioinformatics	• Enzyme • Computational • Engineering • Biocatalysis

COST Countries

Main Proposer: NL

Network of Proposers: AT, CZ, DE, ES, HR, IT, NL, PL, PT, RS, SK

Main and secondary proposers: 8% ECI / 50% Women / 54% ITC

Industrial Dimension

SMEs: AUSTRIA, SPAIN

CA21163
Text, functional and other high-dimensional data in econometrics: New models, methods, applications
(OC-2021-1-25544 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Economics and business: Econometrics, statistical methods applied to economics • Mathematics: Statistics • Mathematics: Numerical analysis • Computer and Information Sciences: Mathematics applied to computer science, mathematical aspects of computer science	• text data, functional data, high-dimensional data • econometrics models and applications • statistical inference • computing • data science

COST Countries

Main Proposer: CY
Network of Proposers: AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LU, NL, NO, PL, PT, RO, RS, SE, SI, SK, TR, UK
Main and secondary proposers: 19% ECI / 38% Women / 50% ITC

International Cooperation
International Partner Country: Hong Kong SAR, United States

Industrial Dimension
Large companies: BULGARIA

CA21164
TowArDs an improVement in diAgNostiCs and trEatment strategies for TB control

(OC-2021-1-25545 - rank: 6 - mark: 50)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide) • Clinical medicine: Microbiology • Medical engineering: Medical laboratory technology (including laboratory samples analysis diagnostic technologies) • Medical engineering: Diagnostic tools (e.g. genetic, imaging) • Health Sciences: Public and environmental health	• tuberculosis • latent tuberculosis infection • diagnostics • treatment • biomarkers

COST Countries

Main Proposer: ES

Network of Proposers: DE, ES, FR, HR, IT, LV, MD, MK, NL, PL, PT, RO, RS, SE, UK

Main and secondary proposers: 20% ECI / 63% Women / 53% ITC

International Cooperation

International Partner Country: Chile, Nigeria, Republic of Guatemala

Industrial Dimension

SMEs: GERMANY, SPAIN, SWEDEN

Large companies: SPAIN

CA21165
Personalized medicine in chronic kidney disease: improved outcome based on Big Data

(OC-2021-1-25562 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Nephrology • Basic medicine: Systems biology • Basic medicine: Databases, data mining, data curation, computational modelling • Biological sciences: Molecular biology and interactions	• Omics • System Biology • Big Data • Computational Modelling • Chronic kidney disease

COST Countries

Main Proposer: DE
Network of Proposers: AL, AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FR, IE, IT, MK, NL, PL, PT, RO, RS, TR, UK
Main and secondary proposers: 9% ECI / 32% Women / 50% ITC

International Cooperation

International Partner Country: Australia

Industrial Dimension

SMEs: AUSTRIA, BULGARIA, FRANCE, GERMANY

CA21166
Social Sciences and Humanities for Transformation and Climate Resilience
(OC-2021-1-25566 - rank: 61 - mark: 41)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Philosophy, Ethics and Religion: Philosophy, history of philosophy • Social and economic geography: Socio-economic aspects of environmental sciences • Sociology: Anthropology, ethnology, cultural studies • Arts: Performing arts • Media and communications: Media and communications, social aspects of information science and surveillance, socio-cultural communication	• Societal Transformation • Social Science and Humanities • Critical Practice • Transdisciplinarity • Climate Resilience

COST Countries

Main Proposer: PT

Network of Proposers: AT, BE, BG, CZ, EE, FR, HU, IE, IT, NO, PL, PT, SI, SK

Main and secondary proposers: 36% ECI / 70% Women / 57% ITC

Industrial Dimension

SMEs: AUSTRIA, POLAND

CA21167
Universality, diversity and idiosyncrasy in language technology
(OC-2021-1-25588 - rank: 66 - mark: 42)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Computer and Information Sciences: Artificial intelligence, intelligent systems, multi agent systems • Languages and literature: Linguistics: formal, cognitive, functional and computational linguistics • Computer and Information Sciences: Machine learning algorithms • Languages and literature: Linguistics: typological, historical and comparative linguistics	• natural language processing • language universals • diversity • idiosyncrasy • language resources and tools

COST Countries

Main Proposer: FR
Network of Proposers: BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IL, IT, LT, LV, MD, MK, MT, NO, PL, PT, RO, RS, SE, SI, SK, TR, UK
Main and secondary proposers: 24% ECI / 56% Women / 56% ITC

International Cooperation
International Partner Country: Australia, India, Japan, United States

Industrial Dimension
SMEs: LATVIA, UNITED KINGDOM
Large companies: GERMANY, INDIA, IRELAND, JAPAN

CA21168
Improving outcome of Juvenile Inflammatory Rheumatism via universally applicable clinical practice strategies
(OC-2021-1-25597 - rank: 40 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Clinical medicine: Paediatrics • Clinical medicine: Rheumatology • Clinical medicine: Innate immunity	• Juvenile Inflammatory Rheumatism • Lupus Nephritis • Autoinflammatory diseases • PFAPA and SURF • Systemic onset Juvenile Idiopathic Arthritis

COST Countries

Main Proposer: CH
Network of Proposers: BG, CH, CZ, DE, EE, FR, HU, IT, LT, NL, PT, SI, SK, TR
Main and secondary proposers: 13% ECI / 70% Women / 64% ITC

CA21169
Information, Coding and Biological Function: the Dynamics of Life
(OC-2021-1-25599 - rank: 40 - mark: 45)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Physical Sciences: Non-linear physics • Mathematics: ODE and dynamical systems • Chemical sciences: Applied mathematics, statistics, non- computational modeling • Biological sciences: Biological systems analysis, modelling and simulation • Biological sciences: Biostatistics	• Theoretical Modelling • Complex Biological Systems • Non-linear Dynamics • Quantum and Classical Information • Biological Codes

COST Countries

Main Proposer: IT
Network of Proposers: BA, DE, DK, ES, FR, HR, HU, IT, NL, PL, PT, RS, SE, SI
Main and secondary proposers: 11% ECI / 23% Women / 50% ITC

International Cooperation

International Partner Country: Argentina, Mexico, United States

CA21170
Prevention, anticipation and mitigation of tick-borne disease risk applying the DAMA protocol

(OC-2021-1-25609 - rank: 24 - mark: 46)

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.

SCIENTIFIC SCOPE

Areas of Expertise	Keywords
• Biological sciences: Ecology • Health Sciences: Infectious diseases • Health Sciences: Public and environmental health • Health Sciences: Epidemiology • Biological sciences: Microbiology	• disease ecology • prevention • tick-borne diseases • DAMA (Document, Assess, Monitor, Act) protocol • climate change

COST Countries

Main Proposer: HU
Network of Proposers: AL, BE, BG, CY, CZ, EL, ES, HR, HU, IT, ME, MK, NL, NO, PL, PT, RO, RS, SE, SI, SK, TR, UK
Main and secondary proposers: 17% ECI / 48% Women / 65% ITC

International Cooperation

European RTD Organisation: Greece