



# **COST Actions approved by the Committee of Senior Officials on 12 February 2016**

**COST Open Call - collection date 8 September 2015 (oc-2015-2)**



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Horizon 2020

**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



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## CA15201 - Archaeological practices and knowledge work in the digital environment

### SUMMARY

As nations and the EU are making considerable investments in technologies, infrastructures and standards for all aspects of working with archaeological knowledge, critical understanding of how this knowledge is produced and used remains fragmentary. This COST action will overcome this fragmentation by forming a transdisciplinary network that brings together the knowledge from individual research projects, national initiatives and EU projects (e.g. CARARE, LoCloud, Europeana Cloud, ARIADNE, DARIAH) in the field of archaeological knowledge production and use. The proposed work is an acute priority and prerequisite for ensuring the expected benefits of the large-scale investments in the cultural heritage sector.

The better coordination of current fragmented efforts to study archaeological practices, knowledge production and use, social impact and industrial potential of archaeological knowledge will 1) strengthen and consolidate the current state of the art, as represented in leading research in the field, on the making and emergence of archaeological knowledge and its application for societal benefit, and 2) provide a basis for guidance to diverse stakeholders responsible for making, regulating, preserving, managing and using archaeological knowledge including field archaeologists, museum professionals, heritage administrators, researchers, policymakers, cultural industry and the public.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● History and Archeology: Archaeology, archaeometry, landscape archaeology</li> <li>● Other humanities: Cultural heritage, cultural memory</li> <li>● Media and communications: Library science</li> </ul>	<ul style="list-style-type: none"> <li>● archaeology</li> <li>● knowledge production</li> <li>● knowledge work</li> <li>● practices</li> </ul>

### COST Countries (12)

Austria, Belgium, Croatia, Denmark, **Finland**, Germany, Greece, Lithuania, Netherlands, Norway, Sweden, United Kingdom

COST Inclusiveness Target Countries: 17%

Industrial participation: SME (2)



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu



## CA15202 - Self-healing as preventive repair of concrete structures

### SUMMARY

The search for smart self-healing materials and preventive repair methods is justified by the increasing sustainability and safety requirements of structures. The appearance of small cracks or defects in concrete is unavoidable, not necessarily causing a risk of collapse for the structure, but certainly accelerating its degradation process and diminishing its service life. That degradation could force an increase of the maintenance operations or the reparation/rehabilitation of the structure. The critical nature of these requirements is signified by their inclusion as priority challenges in the European Research Program.

The first focus of this proposal is to compare the use of self-healing concrete with the use of smart methods for repairing concrete elements. Despite the promising potential of the developed technologies, they will be real alternatives only when sound and comparative characterization and verification techniques are developed. This is the second focus of the proposal. A last but not least important focus is the modelling of the healing mechanisms that take place for the different designs and the prediction of the increase in service life achieved by these methods.

This COST Action will be supported by several well-known laboratories working on different self-healing techniques, repair solutions for existing concrete structures, and characterization and verification techniques. This composition will provide a solid framework to advance in the implementation of innovative and sustainable solutions for the preventive repair of concrete structures.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>• Civil engineering: Sustainable engineering, adaptation to long-term environmental changes</li> <li>• Civil engineering: Construction engineering</li> </ul>	<ul style="list-style-type: none"> <li>• preventive repair methodologies</li> <li>• healing approaches for cement-based materials</li> <li>• durability performance of repaired structures</li> <li>• concrete sustainability</li> <li>• standards in characterization</li> </ul>

### COST Countries (9)

Belgium, Germany, Israel, Italy, Netherlands, Portugal, Romania, **Spain**, United Kingdom

COST Inclusiveness Target Countries: 22%

### International Cooperation

International Partner Country (1): Canada

European RTD Organisations (1)



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu



## CA15203 - Mitochondrial mapping: Evolution - Age - Gender - Lifestyle - Environment

### SUMMARY

The objective of the MITOEAGLE network is to improve our knowledge on mitochondrial function in health and disease related to Evolution, Age, Gender, Lifestyle and Environment. Every study of mitochondrial (mt) function and disease is faced with EAGLE as the essential background conditions characterizing the individual patient, subject, study group, species, tissue or even cell line. To address the complex interrelationships of EAGLE with an initial focus on humans and rodent models, the network will enhance the value of each individual study by starting to analyse and catalog data beyond the published record. Highlighting the topic of gender and mitochondrial function, unique new information will emerge on human biology from the development of a European reference database. Protocols, technologies and standard procedures will be compared and strategies defined for improvement of quality control. An inter-laboratory ring test will be established as a world-wide innovation in the field of mitochondrial respiratory physiology. The expertise gained and new standards developed will be integrated into a strategic dissemination and education programme for mitochondrial phenotyping, aiming at an expanding European and MitoGlobal EAGLE network where researchers collaborate on mapping mitochondrial physiology and medicine, complementary to established mtDNA databases.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Basic medicine: Organelle biology</li> <li>● Biological sciences: Physical chemistry of biological systems</li> <li>● Clinical medicine: Non-communicable diseases</li> </ul>	<ul style="list-style-type: none"> <li>● mitochondrial physiology</li> <li>● reference database</li> <li>● gender</li> <li>● age</li> <li>● lifestyle</li> </ul>

### COST Countries (24)

**Austria**, Belgium, Croatia, Czech Republic, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 46%

### International Cooperation

Near Neighbour Country (1): Egypt

Industrial participation: SME (1), Large company (1)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15204 - European Platform for Outcomes Research into Perioperative Interventions during Surgery for Cancer

### SUMMARY

Cancer remains one of the principal causes of mortality in Europe, usually attributable to metastasis, rather than the primary tumour itself. Surgery is the primary treatment of many tumour types, but minimal residual disease, i.e. scattered micro metastasis during surgery, is usually inevitable. Whether this results in clinical recurrence depends on the balance between conflicting forces at work in the perioperative period, including the patient's immune function, the surgical stress response, postoperative pain, and direct effects of anaesthetic and analgesic drugs and techniques which may either promote or inhibit tumour cell survival.

Since a retrospective clinical study found an association between improved survival after breast cancer with a combined propofol-regional anaesthetic technique, compared with standard general anaesthesia and opioid analgesia, the hypothesis that anaesthetic, analgesic or other perioperative interventions during primary cancer surgery could influence recurrence or metastasis has gained worldwide traction, topping a research priority setting exercise. Conflicting results from multiple retrospective studies in various cancers and the huge potential impact of a positive outcome warrant definitive evidence from prospective, randomised trials. A few have started, but are necessarily protracted, requiring long term patient follow-up.

Many laboratory and translational studies, including using serum of patients randomised to a clinical trial have also produced findings suggestive of a signal that anaesthetic-analgesic technique during cancer surgery might have an hitherto unrecognised effect on recurrence or metastasis. This COST Action would enable co-ordination of activity among a network of active European researchers in this exciting new field of research.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Clinical medicine: Anaesthesiology</li> <li>● Clinical medicine: Oncology</li> <li>● Clinical medicine: Surgery</li> <li>● Clinical medicine: Analgesia</li> </ul>	<ul style="list-style-type: none"> <li>● Anaesthesia, general</li> <li>● Breast Cancer</li> <li>● Anaesthetic technique, regional anaesthesia</li> <li>● Cancer, metastasis</li> </ul>

### COST Countries (10)

Austria, Belgium, **Ireland**, Israel, Italy, Netherlands, Romania, Sweden, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 10%

### International Cooperation

International Partner Country (1): United States



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
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## CA15205 - Gene Regulation Ensemble Effort for the Knowledge Commons

### SUMMARY

Biological knowledge discovery is becoming increasingly dependent on computational modelling and simulation. Model building requires comprehensive knowledge bases describing biological entities and how they work together. However, dedicated action is needed to enter such knowledge in knowledge bases, as scientific results cannot be effectively shared with the community through publications alone: their information content needs to be carefully checked, or curated, and archived in standardised formats in public resources, to become broadly available for computational integration and analysis. Existing resources are significantly fragmented, have limited coverage, may not be compliant with existing data standards or have no documented quality control procedures. Most initiatives for standardising the description, recording and exchange of biological data have been shaped by needs arising from specific molecule- or data types, and not by the challenge to cover all subdomains of a complete biological process domain. This Action specifically targets the domain of gene regulation: transcription factors interacting with the genome and RNA synthesis machinery, orchestrated by a complex web of signal transduction molecules, thus crucial to fully comprehend cellular control mechanisms at the systems level. The Action aims to establish communication and foster coordination of activities of all existing but currently disparate groups in Europe who actively generate and collate data on gene regulation. By including global partners, SMEs, publishing houses, policy makers, and funding agencies in the building of the “Knowledge Commons”, this Action will set the stage for the development of one integrated knowledge management framework for this key area of molecular biology.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Biological sciences: Bioinformatics</li> <li>● Medical biotechnology: Databases, data mining, data curation, computational modelling</li> <li>● Biological sciences: Molecular biology and interactions</li> <li>● Electrical engineering, electronic engineering, Information engineering: Databases, data mining, data curation, computational modelling</li> </ul>	<ul style="list-style-type: none"> <li>● life science knowledge management</li> <li>● curation guidelines</li> <li>● ontologies and controlled vocabularies</li> <li>● information retrieval</li> <li>● scientific data exchange and web services</li> </ul>

### COST Countries (10)

Austria, Belgium, Finland, France, Germany, Netherlands, **Norway**, Portugal, Spain, Switzerland

COST Inclusiveness Target Countries: 10%

### International Cooperation

Near Neighbour Country (1): Russian Federation

International Partner Country (3): Brazil, Japan, New Zealand

European RTD Organisations (1)



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## CA15206 - Payments for Ecosystem Services - Forests for Water

### SUMMARY

The EU Water Framework Directive aims to ensure restoration of Europe’s water bodies to “good ecological status” by 2027. Many Member States will struggle to meet this target, with around half of EU river catchments currently reporting below standard water quality. Diffuse pollution from agriculture represents a major pressure, affecting over 90% of river basins. Accumulating evidence shows that recent improvements to agricultural practices are benefiting water quality but in many cases will be insufficient to achieve WFD objectives. There is growing support for land use change to help bridge the gap, with a particular focus on targeted tree planting to intercept and reduce the delivery of diffuse pollutants to water. This form of integrated catchment management offers multiple benefits to society but a significant cost to landowners and managers.

New economic instruments, in combination with spatial targeting, need to be developed to ensure cost-effective solutions – including tree planting for water benefits - are realised. Payments for Ecosystem Services (PES) are flexible, incentive-based mechanisms that could play an important role in promoting land use change to deliver water quality targets. The PESFOR-W COST Action will consolidate learning from existing woodlands for water PES schemes in Europe and help standardize approaches to evaluating the environmental effectiveness and cost-effectiveness of woodland measures. It will also create a European network through which PES schemes can be facilitated, extended and improved, for example by incorporating other ecosystem services linking with aims of the wider forests-carbon policy nexus.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Hydrology, water resources</li> <li>● Agriculture, Forestry, and Fisheries: Non wood forest products - environmental services</li> <li>● Economics and business: Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>● Payments for Ecosystem Services</li> <li>● Woodlands</li> <li>● Water quality</li> </ul>

### COST Countries (11)

Bulgaria, Czech Republic, Denmark, Germany, Italy, Lithuania, Portugal, Romania, Slovakia, Spain, **United Kingdom**

COST Inclusiveness Target Countries: 55%

### International Cooperation

Near Neighbour Country (1): Morocco

International Partner Country (3): China, New Zealand, United States

International Organisations (1)

Industrial participation: SME (1), Large company (1)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu





## CA15207 - Professionalisation and Social Impact of European Political Science

### SUMMARY

The project ProSEPS aims to build a broad network of scholars - in principle political scientists and political sociologists involved in the comparative study of higher educational systems and the internationalization of research in the field of political science. However, the network will be also open to contributors from other scientific communities, who are in some way interested in comparing the evolution of the subject at the core of this project, with other domains included in the “universe” of contemporary social sciences.

The innovative nature of the project lies in its multidimensional focus: given that the key concepts to be discussed within the network are those of Professionalization and Social Impact, those scholars constituting this network will have to discuss data and the interpretations of such data. More specifically, the coordination of a wide range of relevant studies will allow the network’s scholars to perfect our knowledge of at least four areas of study: a) the transformation of the academic subject (size of the community, internal articulations, main research areas, PhD programmes, etc.); b) the social and media visibility of the subject and its research outcomes; c) the impact of reforms on the rates of international mobility and international circulation of research outcomes; d) the applicability and application of the products of political science, and the social impact of the work of political scientists.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Political Science: Public administration, public policy</li> <li>● Political Science: Political systems and institutions, governance</li> </ul>	<ul style="list-style-type: none"> <li>● political science</li> <li>● professionalisation</li> <li>● social impact</li> <li>● social visibility</li> <li>● internationalization</li> </ul>

### COST Countries (29)

Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, **Italy**, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Poland, Portugal, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom

COST Inclusiveness Target Countries: 52%

### International Cooperation

Near Neighbour Country (2): Russian Federation, Ukraine

International Partner Country (3): Canada, Japan, United States



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15208 - Rationing - Missed Nursing care: An international and multidimensional problem

### SUMMARY

Rationing of nursing care occurs when resources are not sufficient to provide necessary care to all patients. The reasons that lead to this phenomenon include staff reductions, increased demands for care due to the technological advancements, more treatment options, more informed service users, all requiring more time and attention from care professionals. Rationing of nursing care may also occur due to particular approaches of nurses' clinical judgment and knowledge in allocating the resources, and the wider value basis of the society on care. As a result, fundamental patient needs may not be fulfilled and human rights linked to discrimination may be affected.

In view of the increasing evidence indicating a negative effect of nursing rationing on patient outcomes, the fragmented work on the complexity of the topic as well as the gaps regarding issues such as ethics, methodology and patient safety, this Action will enable and facilitate internationally coordinated exchange of expertise and knowledge for both research and clinical practice at European and international level.

This Action will facilitate a debate on the conceptualisation of rationing and the methodological challenges in investigating and monitoring the phenomenon and the development and evaluation of intervention methods. It will also facilitate stakeholders to develop a responsive research agenda that identifies challenges and innovative cost-effective and patient-centered solutions associated with care rationing. It will enable research and policy synergies by drawing out the implications of nursing rationing across countries and identify innovative delivery models and strategies with an overall aim to address patient needs..

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>Health Sciences: Nursing</li> </ul>	<ul style="list-style-type: none"> <li>Nursing Care Rationing</li> <li>Missed Nursing Care</li> <li>Prioritisation And Clinical Judgement In Nursing</li> <li>Nursing Care Priorities</li> </ul>

### COST Countries (15)

Belgium, **Cyprus**, Czech Republic, Finland, Greece, Italy, Lithuania, Norway, Poland, Portugal, Slovakia, Spain, Switzerland, Turkey, United Kingdom

COST Inclusiveness Target Countries: 47%

### International Cooperation

International Partner Country (4): Australia, Canada, New Zealand, United States



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
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## CA15209 - European Network on NMR Relaxometry

### SUMMARY

The “European Network on NMR Relaxometry” Action aims to develop a research network focused on NMR relaxometry for fundamental and applied sciences concerned with the molecular dynamics of soft and hard matter. NMR relaxometry possesses the unique ability to reveal the mechanisms of molecular motion and their characteristic times over a huge range of time scales from picosecond to millisecond, with selectivity in probing the dynamics of molecular and ionic species. This potential of NMR relaxometry will be developed with applications in advanced material science and industry, medical diagnostics and therapeutics, agri-food and environmental sciences and technologies. This research is intrinsically related to progress in the understanding of spin relaxation phenomena and in technological development, as both components form the ground for the fundamental and technology-oriented research employing NMR relaxometry.

NMR relaxometry is a scientific and technological asset of Europe. The joint efforts of scientists across numerous disciplines (chemistry, physics, material science and others), of medical doctors and engineers, regrouped through the networking means provided by this Action, will allow to efficiently exploit NMR relaxometry in fields that are currently key challenges for Europe, such as early disease detection, energy sources and storage, advanced tunable materials, food quality, soil fertility, water and sediment performance. The Action will play a seminal role in facilitating links between the scientific and industrial communities for knowledge exchange and technology transfer to stimulate cross-disciplinary innovations, educate the next generation of talented researchers and develop the full potential of NMR relaxometry in Europe.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Physical Sciences: Atomic, molecular and chemical physics</li> <li>● Physical Sciences: Soft condensed matter (e.g. liquid crystals)</li> <li>● Chemical sciences: Spectroscopic and spectrometric techniques</li> <li>● Medical engineering: Diagnostic tools (e.g. genetic, imaging)</li> <li>● Physical Sciences: Quantum physics</li> </ul>	<ul style="list-style-type: none"> <li>● Nuclear Magnetic Resonance</li> <li>● Fast Field Cycling NMR Relaxometry</li> <li>● Spin Relaxation</li> <li>● Dynamics of Condensed Matter</li> <li>● Magnetic Resonance Imaging</li> </ul>

### COST Countries (20)

Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Netherlands, **Poland**, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 30%

### International Cooperation

International Partner Country (2): Argentina, Brazil

International Organisations (1)

Industrial participation: SME (4), Large company (3)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15210 - European Network for Collaboration on Kidney Exchange Programmes

### SUMMARY

About one per thousand European citizens suffers from end stage renal disease. Living donor kidney transplantation is often the most effective treatment and the alternative of deceased donor kidney transplantation is severely limited by availability. As approximately 40% of living donors are incompatible with their specified recipient, several European countries have independently developed kidney exchange programmes (KEPs).

KEPs aim to match donors optimally to recipients for organ exchange within the population of recipient-donor pairs. Recent research shows that KEPs may greatly improve survival probabilities and quality of life, especially for recipients that are difficult to match. These recipients are disadvantaged disproportionately by the small scale of many national (or local) KEPs in Europe.

KEPs vary regarding the solutions provided for the problems in (i) the policy domain (prioritisation, equity, and accessibility); (ii) the clinical domain (clinical practice and evidence); and (iii) the optimisation domain (methods to solve the hard dynamic multi-criteria matching problems which take clinical evidence and health policy into account). Knowledge sharing among European KEPs, exchange of best practices, and practical collaboration are very scarce.

ENCKEP brings together policy makers, clinicians and optimisation experts in Europe to (i) exchange best practices and scientific state of the art with respect to national KEPs (ii) develop a jointly-used, common framework for data and optimisation; (iii) develop and test a prototype for transnational KEPs; and (iv) stimulate European policy dialogue. ENCKEP is expected to have substantial impact on the medical / socioeconomic, technological as well as scientific domains.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Mathematics: Discrete mathematics and combinatorics</li> <li>● Computer and Information Sciences: Algorithms, distributed, parallel and network algorithms</li> <li>● Clinical medicine: Transplantation</li> <li>● Health Sciences: Health services, health care research</li> </ul>	<ul style="list-style-type: none"> <li>● Transplantation</li> <li>● Allocation</li> <li>● Exchange</li> <li>● Optimization</li> </ul>

### COST Countries (15)

Austria, Czech Republic, Estonia, France, Germany, Hungary, Italy, **Netherlands**, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 40%

### International Cooperation

International Partner Country (2): Australia, United States



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu



## CA15211 - Atmospheric Electricity Network: coupling with the Earth System, climate and biological systems

### SUMMARY

An atmospheric electric field (AEF) of 100 V/m to several kV/m exists in the atmosphere, resulting from a global electric circuit extending from the surface to the lower ionospheric layers. The study of many environmental processes can benefit substantially by the inclusion of atmospheric electricity. Such processes include, but are not limited to, earthquakes, aerosols / clouds and climate, sun-earth interactions, air pollution, lightning etc. Further, there is emerging evidence that AEF variations may interfere with biological processes, including human brain function. To overcome the lack of coordination of different research efforts in these fields, the proposed Action aims to involve and integrate existing resources in the field of atmospheric electricity, create a network, enhance interaction and create the necessary critical mass of researchers and facilities to advance knowledge, introduce new techniques, transfer know-how. By these means the Action will also improve the understanding of a number of processes that lie at the interface of solid earth, environmental, biological, climatic and solar/terrestrial sciences.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Meteorology, atmospheric physics and dynamics</li> <li>● Earth and related Environmental sciences: Climatology and climate change</li> <li>● Biological sciences: Biophysics</li> </ul>	<ul style="list-style-type: none"> <li>● atmospheric electricity</li> <li>● potential gradient</li> <li>● climate</li> <li>● natural hazards</li> <li>● biological effects</li> </ul>

### COST Countries (11)

Cyprus, Finland, Germany, **Greece**, Hungary, Israel, Netherlands, Poland, Portugal, Romania, United Kingdom

COST Inclusiveness Target Countries: 45%

Industrial participation: SME (2)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
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## CA15212 - Citizen Science to promote creativity, scientific literacy, and innovation throughout Europe

### SUMMARY

We are witnessing a remarkable growth of citizen science, that is, the participation of people from all walks of life in scientific research. The main aim of this Action is to bundle capacities across Europe to investigate and extend the impact of the scientific, educational, policy, and civic outcomes of citizen science with the stakeholders from all sectors concerned (e.g., policy makers, social innovators, citizens, cultural organizations, researchers, charities and NGOs), to gauge the potential of citizen science as enabler of social innovation and socioecological transition. The Action will explore the potential transformative power of citizen science for smart, inclusive, and sustainable ends, and will provide frameworks for the exploitation of the potential of European citizens for science and innovation. The relevance and timeliness of the Action derive from the recent explosion of activity around citizen science, as ordinary people and researchers begin to understand the power of technological devices which allow them to record the environment around them and share and collectively interpret data and knowledge to advance science and society.

Given the transdisciplinarity of citizen science, the Action will benefit from the different contributions and perspectives from a range of disciplines and research cultures. As the latter rarely overlap and engage directly, the Action provides an ideal means for knowledge sharing and focused development on the topic by enabling better integration of separate national activities at a European and international scale.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Biological sciences: Conservation biology, ecology, genetics</li> <li>● Social and economic geography: Social and industrial ecology</li> <li>● Other engineering and technologies: Sustainability for other engineering and technologies</li> <li>● Sociology: Sociology of science</li> <li>● Educational sciences: Education - training, pedagogy, didactics</li> </ul>	<ul style="list-style-type: none"> <li>● citizen science</li> <li>● capacity building</li> <li>● sustainable development</li> <li>● participation</li> <li>● social and technological innovation</li> </ul>

### COST Countries (25)

Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, **Germany**, Greece, Hungary, Ireland, Israel, Italy, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 36%

### International Cooperation

International Partner Country (2): New Zealand, United States

Industrial participation: SME (3)



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 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
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## CA15213 - Theory of hot matter and relativistic heavy-ion collisions

### SUMMARY

Matter under extreme conditions in terms of temperature and density, as in the early Universe or in compact stellar objects (e.g. neutron stars) can be created and studied with the help of relativistic heavy ion collisions. Scientifically, the main aim is to explore and reconstruct the matter's transport properties, phase structure, in-medium properties of hadrons and active degrees of freedom of Quantum Chromodynamics (QCD) from the experimental measurements of individual quantities. While the experimental activities are organised and optimised in large international collaborations, there is no such structure for theoretical activities.

The proposed COST Action "Theory of hot matter and relativistic heavy-ion collisions" (THOR) creates a theoretical community platform as counterpart to the ongoing vigorous experimental activities. THOR will for the first time allow to fully exploit Europe's exceptional potential in this field of theoretical research. THOR will pioneer novel approaches to the theoretical understanding of the properties of QCD from first principles and on the interpretations of these properties by effective models and numerical simulations of the system's evolution. By this, THOR will provide new insights on the paramount questions of the field. Therefore THOR aims at bringing together excellent researchers in order to pinpoint and discuss the challenges that the field meets currently and in the near future for creating a vibrant, innovative and world-leading pan-European research environment.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>Physical Sciences: Nuclear physics (theory)</li> </ul>	<ul style="list-style-type: none"> <li>Nuclear Physics</li> <li>Heavy Ion Physics</li> <li>Quantum Chromo-Dynamics</li> <li>Strongly interacting systems</li> <li>Theoretical Physics</li> </ul>

### COST Countries (17)

Austria, Croatia, Czech Republic, Finland, France, **Germany**, Greece, Hungary, Israel, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom

COST Inclusiveness Target Countries: 43%

### International Cooperation

Near Neighbour Country (2): Russian Federation, Ukraine

European RTD Organisations (1)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15214 - An integrative action for multidisciplinary studies on cellular structural networks

### SUMMARY

Structural networks that connect the extracellular matrix and cell surfaces through the cytoskeleton with the nucleoskeleton govern cell, tissue and organ integrity. Besides their structural roles, these networks participate in a multitude of fundamental functions, e.g. regulating signal- and mechano-transduction, cytoplasmic transport, sequestering biomolecules, maintaining genome organization and promoting meiosis. Mutations in the building blocks of these networks frequently lead to devastating diseases. The pathogenesis of these diseases is far from being understood and requires a wide interdisciplinary approach that is distinct from the individual research schemes. Based on capacity building measures, coordinated networking and educative activities and interactions with business partners and European research infrastructures, the EuroCellNet Action aims to develop an orchestrated multinational activity grid, organized in four Working Groups: 1) Biophysics of cell and tissue structure, 2) Structural analysis of biomolecules involved in mechanobiology, 3) New methodologies to study mechanobiology of cells and tissues, and 4) Mechanobiological principles of rare and common diseases. The Action will target researchers from molecular and cell biology, genetics, biophysics, structural biology, mechanobiology, neurobiology, developmental biology, pathology, and translational medicine. The Action will also develop new bridging and educative activities, and provide the scientists with a unifying dedicated website with on-line tools facilitating the interactions and exchange of information. There is a high interest for such an Action, underscoring the current need for such an Action. The 45 Action proposers originate from 33 countries bridge the gap between less-research intensive countries and leading research countries.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Biological sciences: Molecular biology and interactions</li> <li>● Biological sciences: Structural biology (crystallography, NMR, EM)</li> <li>● Biological sciences: Epigenetics and gene regulation</li> <li>● Biological sciences: Morphology and functional imaging of cells</li> <li>● Basic medicine: Molecular and cellular neuroscience</li> </ul>	<ul style="list-style-type: none"> <li>● structural proteins</li> <li>● mechanobiology</li> <li>● mechanotransduction</li> <li>● cell biology</li> <li>● pathogenesis</li> </ul>

### COST Countries (30)

Austria, Belgium, Bosnia and Herzegovina, Croatia, Cyprus, **Czech Republic**, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Israel, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom

COST Inclusiveness Target Countries: 50%

### International Cooperation

Near Neighbour Country (1): Russian Federation

International Partner Country (3): Japan, Singapore, United States

International Organisations (1)



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu





## CA15215 - Innovative approaches in pork production with entire males

### SUMMARY

Surgical castration of boars without pain relief is now considered unacceptable. Stakeholders of the pork chain committed themselves to voluntarily end surgical castration of male pigs in Europe by January 1st, 2018. The production of entire males (EM) or immunocastrates (IC) results in new challenges in management of product quality (detecting and reducing boar taint, coping with extreme leanness), specific nutritional requirements, appropriate animal management and housing to reduce boar taint and address associated animal welfare issues (aggression, sexual behaviour). Thus, EM and IC production require reconsideration of the whole pork production system, and innovations at all levels of the food chain to achieve high sustainability and product quality. Partially, these aspects have been studied previously but there are still a range of unresolved relevant issues. Additionally, a knowledge gap exists between the Western and Eastern parts of Europe, either due to differences in traditional production systems or differences in public perception of animal welfare aspects. A better coordinated research effort and training of young researchers at international level would significantly improve research efficiency, accelerate knowledge acquisition and dissemination. The COST Action will accelerate innovations by networking, by developing and disseminating science-based best practices to achieve good production quality with EM or IC. It will support the meat industry to cope with the challenge to produce equally valuable products from meat of EM or IC which is adequate for regional specific consumer demands.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Animal and dairy science: Agriculture related to animal husbandry, dairying, livestock raising, animal welfare</li> <li>● Animal and dairy science: Food chemistry</li> <li>● Biological sciences: Genomics, comparative genomics, functional genomics</li> <li>● Animal and dairy science: Microbiology</li> <li>● Veterinary science: Veterinary medicine (miscellaneous)</li> </ul>	<ul style="list-style-type: none"> <li>● Sustainable animal friendly pork production with males</li> <li>● High quality pork production with boars and immunocastrates</li> <li>● Consumer sensibilization and information</li> <li>● Genetics of boar taint prevention</li> <li>● Product development and carcass neo-grading</li> </ul>

### COST Countries (18)

Belgium, Bulgaria, Czech Republic, Denmark, France, **Germany**, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 39%

### International Cooperation

Near Neighbour Country (1): Canada

International Partner Country (1): Ukraine

Industrial participation: SME (4)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15216 - European Network of Bioadhesion Expertise: Fundamental Knowledge to Inspire Advanced Bonding Technologies

### SUMMARY

Many organisms, ranging from bacteria and fungi to those much larger animals and plants use chemical and mechanical means to attach permanently or temporarily to surfaces. Some bioadhesives have advantages over synthetic counterparts in terms of their ability to function over a wide temperature range, in wet or dry environments, and to form stable bonds within seconds to all manner of substrata, even those with challenging surface coatings.

Knowledge about these materials, in terms of composition, structural design and interactions with surfaces, is necessary to reveal the basic biochemical and mechanical principles involved in biological adhesion.

This COST Action “European Network of Bioadhesion Expertise - ENBA” will unite the widespread European expertise in the field of biological adhesives (spanning biology, physics, chemistry, and engineering) by streamlining and pooling knowledge, methods and techniques, and will focus activities by avoiding duplication of efforts, decreasing research costs, and accelerating scientific and technological progress in Europe.

The bottom-up approach of this COST Action, integrating universities, applied research organisations and industry into an holistic program providing technical and scientific progress in understanding the fundamentals of natural bonding principles and test these natural systems in vitro. Knowledge achieved in this COST Action would certainly have a major impact on European academia and industrial competitiveness in the field of adhesion, nanotechnology, biomaterial and biotechnology and raise public awareness of the diversity of bioadhesives and their impact for technical applications in the future.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Biological sciences: Biodiversity, comparative biology</li> <li>● Biological sciences: Biological systems analysis, modelling and simulation</li> <li>● Biological sciences: Biochemistry</li> <li>● Biological sciences: Biophysics</li> </ul>	<ul style="list-style-type: none"> <li>● Bioadhesive</li> <li>● Glue</li> <li>● Bonding</li> <li>● Biointerface</li> <li>● Attachment</li> </ul>

### COST Countries (17)

Austria, Belgium, Czech Republic, Denmark, France, **Germany**, Greece, Ireland, Israel, Italy, Netherlands, Poland, Portugal, Romania, Spain, Turkey, United Kingdom

COST Inclusiveness Target Countries: 29%

### International Cooperation

European RTD Organisations (1)

Industrial participation: SME (3)



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu



## CA15217 - Ocean Governance for Sustainability - challenges, options and the role of Science

### SUMMARY

The subject of governance of oceanic systems and coastlines is moving into the center of European strategic and sustainability interests. Yet, it suffers from a high degree of fragmentation and the lack of a cross-scalar approach to addressing prevailing policy shortcomings. The proposed COST Action on “Ocean Governance for Sustainability - Challenges, Options and the Role of Science” comprises a unique, transdisciplinary network of 58 proposers with regional and international outreach. The network aims to establish an integrative vision, and a series of approaches that informs research and future policy directions on crosscutting sustainability-driven issues related to the fragmented governance framework of oceans, seas and coastlines within regional waters, and the open ocean in areas beyond national jurisdiction. The network differs from thematic predecessors in two distinct ways: While attending to the multiple flows and connectivities between varied marine systems together with land- and sea-based interfaces that are biologically, culturally, politically and socio-economically entwined, it first renders equal importance to strengthening regional and interdisciplinary dialogue, producing scientific output, crosscutting the natural and social sciences. Synergistic issue-driven working groups will be created at a time when Europe is considering its role in global ocean governance, and will continue to evolve well after the COST Action ends. Second, the network creates a distinct multi-scalar and cross-sectoral platform for institutional partners across academia, policymaking and civil society, presenting inclusive spaces for transdisciplinary dialogue, capacity development and the advancement of practical toolkits that attend to science-policy gaps inherent within integrated ocean and coastal governance.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Social and economic geography: Social, cultural and economic geography, international trade</li> <li>● Earth and related Environmental sciences: Oceanography (other)</li> <li>● Economics and business: Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>● Integrated ocean and coastal governance</li> <li>● Land-sea interactions</li> <li>● Marine spatial planning</li> <li>● Food security and fisheries</li> </ul>

### COST Countries (19)

Belgium, Croatia, Cyprus, Denmark, France, **Germany**, Greece, Ireland, Israel, Italy, Netherlands, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom

COST Inclusiveness Target Countries: 32%

### International Cooperation

Near Neighbour Country (1): Ukraine

International Partner Country (4): Australia, Canada, French Polynesia, United States

European Commission and EU Agencies(1)

Industrial participation: SME (1)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15218 - Measuring homelessness in Europe

### SUMMARY

There is no consensus yet concerning the most valid and reliable methods to measure and monitor homelessness in Europe. A coordinated European approach, as will be achieved in this COST Action is necessary to tackle these limitations in research and make progress on the development of a European wide scientifically based methodology to measure homelessness. More specifically, the purpose of this network is (1) to bring together the expertise and knowledge with regard to measuring homelessness, (2) to tackle specific measurement challenges (such as hidden homelessness, homelessness careers and the diffusion between homelessness and migration) and (3) to create a common European framework on measuring homelessness.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"><li>● Sociology: Social structure, inequalities, social mobility, social exclusion, income distribution, poverty</li></ul>	<ul style="list-style-type: none"><li>● Homelessness</li><li>● Poverty</li><li>● Monitoring</li></ul>

### COST Countries (8)

**Belgium**, Denmark, Germany, Hungary, Ireland, Netherlands, Portugal, United Kingdom

COST Inclusiveness Target Countries: 25%

Industrial participation: SME (1)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15219 - Developing new genetic tools for bioassessment of aquatic ecosystems in Europe

### SUMMARY

The protection, preservation and restoration of aquatic ecosystems and their functions is of global importance. For European states it became legally binding mainly through the EU-Water Framework Directive (WFD). In order to assess the ecological status of a given water body, aquatic biodiversity data are obtained and compared to a reference water body. The quantified mismatch thus obtained determines the extent of potential management actions. The current approach to biodiversity assessment is based on morpho-taxonomy. This approach has many drawback such as being time consuming, limited in temporal and spatial resolution, and error-prone due to variation of individual taxonomic expertise of the analysts. Novel genomic tools can overcome many of the aforesaid problems and could complement or even replace traditional bioassessment. Yet, a plethora of approaches are independently developed in different institutions, thereby hampering any concerted routine application. The goal of this Action is to nucleate a group of researchers across disciplines with the task to identify gold-standard genomic tools and novel eco-genomic indices for routine application for biodiversity assessments of European water bodies. Furthermore, DNAqua-Net will provide a platform for training of the next generation of European researchers preparing them for the new technologies. Jointly with water managers, politicians and other stakeholders, the group will develop a conceptual framework for the standard application of eco-genomic tools as part of legally binding assessments.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Hydrology, water resources</li> <li>● Biological sciences: Biodiversity, comparative biology</li> <li>● Environmental biotechnology: Diagnostic biotechnologies (DNA chips and biosensing devices) in environmental management</li> <li>● Environmental engineering: Water management and technology</li> <li>● Biological sciences: Conservation biology, ecology, genetics</li> </ul>	<ul style="list-style-type: none"> <li>● Water Framework Directive</li> <li>● Nature Conservation</li> <li>● Genetic bioassessment</li> <li>● Biodiversity</li> <li>● environmental DNA</li> </ul>

### COST Countries (15)

Belgium, Estonia, Finland, France, **Germany**, Greece, Hungary, Italy, Netherlands, Norway, Poland, Romania, Slovakia, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 33%

### International Cooperation

Near Neighbour Country (1): Georgia

International Partner Country (3): Canada, New Zealand, United States

Industrial participation: SME (1)



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu



## CA15220 - Quantum Technologies in Space

### SUMMARY

The scientific and technological legacy of the 20th century includes milestones such as quantum mechanics and pioneering space missions. Both endeavours have opened new avenues for the furthering of our understanding of Nature, and are true landmarks of modern science.

Quantum theory and space science form building blocks of a powerful research framework for exploring the boundaries of modern physics through the unique working conditions offered by experimental tests performed in space. Space-based sources of entangled photons promise the formation of global quantum communication networks, long-distance tests of quantum theory and the interplay between relativity and quantum entanglement. Long free-fall times enable high-precision tests of general relativity and tests of the equivalence principle for quantum systems. Harnessing microgravity, high vacuum and low temperature of deep space promises allowing the study of deviations from standard quantum theory for high-mass test particles. Space-based experiments of metrology and sensing will push the precision of clocks, mass detectors and transducers towards the engineering of novel quantum technologies.

Such an exciting framework is what “Quantum Technologies in Space (QTSpace)” aims at providing. By fostering concerted research efforts directed towards the development of a new paradigm for quantum technologies, QTSpace will embody a visionary opportunity for furthering the comprehension of fundamental mechanisms of physics in an entirely new context. The proposed Action puts together a network of genuine European dimensions. Its technical and scientific excellence, strongly inclusive character, and ambitious research vision will lead QTSpace towards the achievement of inter-sectorial benefits of fundamental and applied nature.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Physical Sciences: Quantum physics</li> <li>● Physical Sciences: Lasers, ultra-short lasers and laser physics</li> <li>● Physical Sciences: Relativity</li> <li>● Physical Sciences: Metrology and measurement (theory)</li> <li>● Physical Sciences: Ultra-cold atoms and molecules</li> </ul>	<ul style="list-style-type: none"> <li>● quantum technology</li> <li>● space</li> <li>● foundations of physics</li> <li>● relativity</li> <li>● matter waves</li> </ul>

### COST Countries (23)

Austria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, **Italy**, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom

COST Inclusiveness Target Countries: 39%



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15221 - Advancing effective institutional models towards cohesive teaching, learning, research and writing development

### SUMMARY

This project addresses the challenge of creating synergy among the increasingly more specialised and centralised supports for four key higher education activities - research, writing, teaching and learning - which frequently fail to capitalise on their shared territories and common ground. In many institutions, central support for these four areas continues to grow, repeatedly in a reactive rather than strategic manner, in the form of sometimes overlapping programmes or activities, centres, institutes and other units. This responsive growth, often influenced by external forces, can result in the goals, structures and services of these central supports being less than optimal. Equally, what contributes to success, productivity and quality of outcomes, across research, writing, teaching and learning, can remain tacit, ill defined or indeed invisible. Our project addresses the dearth of professional conversations and research around the shared territory of support for, and development of, these four areas. Such dialogue and research, across units and institutions, will illuminate intersections and contribute to institutional transformation based on complementary, coherent and integrated provision.

This Action will address the identified challenge by:

- classifying, as 'frontier taxonomies', the common ground in terms of shared purposes, processes, knowledge, values and skills among centralized institutional supports for research, writing, teaching and learning in order to capitalise on their synergies
- offering the most advantageous models and practices for supporting these four areas that are mindful of the availability of new technologies and assessments and that prompt a reworking of current institutional supports which will be valuable and far-reaching.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Educational sciences: Education - training, pedagogy, didactics</li> <li>● Languages and literature: Linguistics - formal, cognitive, functional and computational linguistics</li> </ul>	<ul style="list-style-type: none"> <li>● Higher Education Pedagogy - Teaching and Learning</li> <li>● Higher Education Academic Writing</li> <li>● Building research capacity and processes</li> <li>● Higher Education institutional transformation and reform</li> <li>● Innovation in higher education central supports</li> </ul>

### COST Countries (17)

Cyprus, Denmark, Estonia, Germany, **Ireland**, Italy, Netherlands, Portugal, Spain, Sweden

COST Inclusiveness Target Countries: 30%

### International Cooperation

Near Neighbour Country (3): Armenia, Egypt, Lebanon

International Partner Country (3): Canada, Saudi Arabia, United States



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu



## CA15222 - European Network for cost containment and improved quality of care

### SUMMARY

This COST Action aims to support the scientific R&D and technology development necessary for a breakthrough in the field of cost-containment in healthcare while also maintaining the quality of care. So far, the EU R&D agenda has given little to no attention to this aspect while in nearly every COST Member Country emerging costs for healthcare are becoming a major societal problem (EU wide €1.400 billion/year).

While the rising trend in costs is continuous and significant, the chances for efficiency gains and costs reductions are large (> 35%). However, previous attempts to reduce costs within existing healthcare systems have shown that simply making these systems more effective and efficient does not lead to the necessary cost reduction that will keep healthcare sustainable and affordable for all European citizens. Instead, innovative care models need to be developed that factor in cost containment from the start, while also maintaining the quality of care.

The EU-commission recognized the gap in their R&D agenda and supported the development of a EU R&D Strategy and Roadmap. This development involved key players from all over Europe representing the fragmented healthcare sector and the many scientific disciplines involved in R&D and technology development in this field. This COST Action sets out to expand and utilize this network in order to attune the ongoing R&D and technology development efforts towards the development of integrated care models that can be tested in large scale settings with the support of all stakeholders involved to create the needed breakthrough.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Health Sciences: Health services, health care research</li> <li>● Economics and business: Public economics, political economics</li> <li>● Sociology: Population dynamics, demography</li> <li>● Medical engineering: Databases, data mining, data curation, computational modelling</li> <li>● Clinical medicine: Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>● Cost containment</li> <li>● quality of care</li> <li>● innovative care models</li> <li>● large scale testing</li> <li>● R&amp;D Roadmap</li> </ul>

### COST Countries (7)

Belgium, Germany, Israel, Netherlands, Slovenia, **Sweden**, United Kingdom

COST Inclusiveness Target Countries: 14%

### International Cooperation

International Partner Country (1): United States

Industrial participation: Large company (1)



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu





## CA15223 - Modifying plants to produce interfering RNA

### SUMMARY

Methods to exploit plant defence mechanisms or changing plant metabolism by RNA silencing show great potential. Interfering RNA can be used to improve plant composition while enhancing levels of beneficial nutrients, and to improve plant productivity by suppressing undesirable traits and switching resources to more beneficial quality and yield traits. Gene expression in pathogens and pests can be targeted and plants modified to produce dsRNAs which trigger silencing and affect essential physiological functions in pest or disease-causing organisms. Many of the modes of activity of the micro- and small interfering RNAs (miRNAs, siRNAs) that mediate the silencing effect are not yet fully understood and knowledge of systemic propagation, turnover, specificity etc. of these molecules is limited. This Action will define and coordinate the most important research tasks for the development of these novel transgenic strategies across many EU and nearby countries with inputs from cooperating researchers in Associated countries in N and S America, Australasia etc..

Activities Include :

- Evaluation of the efficacy of the RNA molecules for the induction of disease and pest resistance and metabolic changes .
- Examination of the specificity of the selected miRNAs and siRNAs and their impacts on both target and non-target/off-target systems.
- Developing specific risk assessment and risk management guidelines which relate specific effects of the miRNAs and siRNAs on food, feed and the environment.
- Understanding the modes of transmission, uptake, systemic spread and degradation of dsRNAs, mi- and siRNAs.
- Determining the environmental and socio-economic impacts of plantRNAi technology & products.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Agricultural biotechnology: Genetic engineering, transgenic organisms, recombinant proteins, biosensors for agricultural biotechnology, animal biotechnology</li> <li>● Agricultural biotechnology: Biotechnology (non-medical)</li> <li>● Other agricultural sciences: Sustainable production</li> <li>● Biological sciences: RNA synthesis, processing, modification and degradation</li> </ul>	<ul style="list-style-type: none"> <li>● RNAi</li> <li>● Plants</li> <li>● Disease</li> <li>● Pest</li> <li>● Quality</li> </ul>

### COST Countries (24)

Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, Germany, Hungary, **Italy**, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom

COST Inclusiveness Target Countries: 50%

### International Cooperation

International Partner Country (5): Argentina, Australia, Brazil, Canada, United States

European Commission and EU Agencies (1)

Industrial participation: SME (5), Large company (1)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15224 - Identifying causes and solutions of keel bone damage in laying hens

### SUMMARY

The KeelBoneDamage COST Action will provide the European laying hen industry with the innovations in breeding, nutrition, and management necessary to resolve the problem of Keel bone damage (KBD) in order to meet the high standards of welfare and productivity demanded by the European community. The extremely high frequency and severity of KBD represents one of the greatest welfare problems facing the industry as suggested by several of the leading authorities in animal welfare, including the UK's Farm Animal Welfare Committee and EFSA. More critically, KBD appears to be exacerbated by recent transitions imposed by EU legislation which banned the use of conventional battery cages from January 2012. Although conceived with the best of intentions and a bold step to improve hen welfare, the unexpected consequences are a blight on Europe's moral standing and as a result of this well-intended legislation, the laying hen industry is now faced with the unexpected challenge of greatly increased KBD leading to reduced animal welfare and farm productivity. The proposed framework seeks to provide a platform for collaboration on the the causes of KBD and solutions to reduce their severity and frequency. The Action brings various participants with a diverse mix of disciplines, ages, and geographies together to facilitate novel and trans-disciplinary discussions that will lead to definitive and quantifiable outputs. Advancements will be performed in concert with industrial partners whom are leaders in the field ensuring that developments are directed into tangible outputs that improve animal welfare and farm productivity.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>• Animal and dairy science: Agriculture related to animal husbandry, dairying, livestock raising, animal welfare</li> <li>• Veterinary science: Veterinary medicine (miscellaneous)</li> </ul>	<ul style="list-style-type: none"> <li>• hen</li> <li>• welfare</li> <li>• bone health</li> <li>• fracture</li> </ul>

### COST Countries (11)

Belgium, France, Germany, Netherlands, Norway, Slovakia, Slovenia, Sweden, **Switzerland**, Turkey, United Kingdom

COST Inclusiveness Target Countries: 27%

### International Cooperation

Near Neighbour Country (1): Egypt  
European Commission and EU Agencies (1)

Industrial participation: SME (3), Large company (2)



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**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu



## CA15225 - Fractional-order systems: analysis, synthesis and their importance for future design

### SUMMARY

Fractional-order systems have lately been attracting significant attention and gaining more acceptance as generalization to classical integer-order systems. Mathematical basics of fractional-order calculus were laid nearly 300 years ago and since that it has gained deeply rooted mathematical concepts. Today, it is known that many real dynamic systems cannot be described by a system of simple differential equation or of integer-order system. In practice we can encounter such systems in electronics, signal processing, thermodynamics, biology, medicine, control theory, etc. The Action will favour scientific advancement in above mentioned areas by coordinating activities of academic research groups towards an efficient deployment of fractal theory to industry applications. The cooperation of researchers from different institutions will guarantee wide visibility to Action results.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Electrical engineering, electronic engineering, Information engineering: Signal processing, 1-D and multidimensional signal processing, compression, signal acquisition</li> <li>● Electrical engineering, electronic engineering, Information engineering: Simulation engineering and modelling</li> <li>● Mathematics: Theoretical aspects of partial differential equations</li> <li>● Health Sciences: Applied mathematics, statistics, non-computational modeling for health sciences</li> </ul>	<ul style="list-style-type: none"> <li>● Fractional calculus, modelling and approximation</li> <li>● Fractional-order elements, analogue/digital blocks</li> <li>● Optimal control</li> <li>● FO systems in biomedicine</li> </ul>

### COST Countries (17)

Belgium, **Czech Republic**, Estonia, France, Germany, Greece, Israel, Italy, Netherlands, Norway, Poland, Portugal, Serbia, Slovakia, Sweden, Turkey, United Kingdom

COST Inclusiveness Target Countries: 41%

### International Cooperation

Near Neighbour Country (1): Russian Federation

Industrial participation: SME (1)



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**COST Association**  
 Avenue Louise 149 | 1050 Brussels, Belgium  
 t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
 office@cost.eu | www.cost.eu



## CA15226 - Climate-Smart Forestry in Mountain Regions

### SUMMARY

Climate-Smart Agriculture (CSA) integrates the three-dimensions of sustainable development (economic, social and environmental), and aims at sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change (CC), and reducing greenhouse gas emissions. CLIMO wants to translate the CSA concept for a Climate-Smart Forestry (CSF). Three main pillars will be considered: improve livelihood of mountain inhabitants by sustainably increasing forest ecosystem services (ES); enhance the adaptation and resilience to CC of mountain forests; optimise the CC mitigation potential of mountain forests, focusing on the most efficient and cost-effective mitigation options and capitalising on adaptation-mitigation synergies. The main objective is to define CSF in the European context, which will require the identification of key silvicultural characteristics and the harmonisation of CSF in mountain areas to create a common knowledge at European level. The “smartness” of the European forests will be defined according to the sustainability of forest management and mitigation potential. The “smartness” will be defined on the basis of measurable criteria and a checklist of parameters of “smartness” for mountain forests will be proposed. Experimental forest sites with available data to quantify the “smartness” of mountain forests will be identified to build a European Smart Forest Network (ESFONET). A feasibility study for the development of a cyber-technology able to quickly transfer data from monitoring sites to stakeholders will be developed. Innovative schemes of payment for ES (PES) will be developed to shift the objective of mountain forest management from the production of timber to the production of ES.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Agriculture, Forestry, and Fisheries: Sustainable forest management</li> </ul>	<ul style="list-style-type: none"> <li>● Forest management</li> <li>● Ecological resilience</li> <li>● Stand complexity</li> <li>● Mitigation options</li> <li>● Ecosystem services</li> </ul>

### COST Countries (14)

Austria, Bosnia and Herzegovina, Bulgaria, France, Germany, Hungary, **Italy**, Norway, Portugal, Slovakia, Slovenia, Spain, Switzerland, United Kingdom

COST Inclusiveness Target Countries: 43%



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