EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

New COST Action proposals 2011

1. Collection OC-2010-2
2. Collection OC-2011-1

EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

New COST Action proposals

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Action BM1101

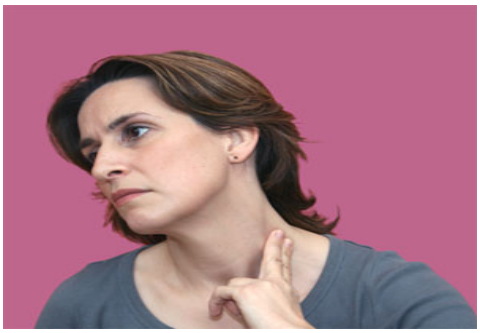
European network for the study of dystonia syndromes

Objectives

The main objective of the Action is foster the creation of an interdisciplinary network of experts in neurology, genetics, neuroscience, behavioural sciences, neurosurgery, bioinformatics, and statistics, with the goal to develop experimental animal models, improve the standard of care and educate professionals and increase public awareness about the disorder.

Abstract

Dystonia syndromes (DS) are the third most common movement disorder, yet they are poorly understood and are under diagnosed. The causes of these disabling neurological conditions are poorly known and the mechanisms that give rise to the uncontrollable involuntary movements have not been elucidated. Particularly the role played by genetic and environmental factors is unclear. Scientific initiatives are fragmented across Europe and hampered by insufficient dimension. This Action will foster the creation of an interdisciplinary network of experts to promote genetic studies of DS, develop experimental animal models, standardise and harmonise patient care and educate the public and professionals about the disorder. It will create a unified platform for sharing expertise and exchanging procedures among centres in COST countries.



Keywords: Dystonia, genetics, diagnosis and treatment, animal models, pathophysiology

Working Groups

WG1 Genetic studies of DS
WG2 Animal models of DS
WG3 Standardisation and harmonisation of clinical practices
WG4 E-infrastructure for European cooperation on DS

Action BM1102

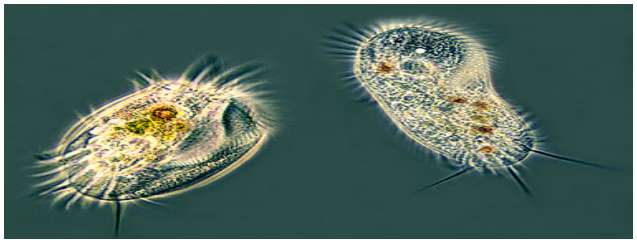
Ciliates as model systems to study genome evolution, mechanisms of non-Mendelian inheritance, and their roles in environmental adaptation

Objectives

The aim of this Action is to establish a network of ciliatologists in order to strengthen and consolidate European research in this area aiming at deciphering the molecular mechanism underlying epigenetics, non-Mendelian inheritance and environmental adaptation.

Abstract

Darwinian selection of random mutations is considered the driving force for evolution. However, it is now clear that acquired characters can also be transmitted from one generation to the next through non-Mendelian inheritance, with influence on cell differentiation and occurrence of diseases. Important questions are whether environmental changes can induce such epigenetic variation and if these variations drive adaptation. COST Action on ciliates will greatly contribute to unravelling the molecular mechanisms of non-Mendelian heredity.



Keywords: Epigenetics, comparative genomics, environmental changes, molecular adaptation, DNA rearrangements

Working Groups

WG1 Developmentally regulated, alternative genome rearrangements showing non-Mendelian inheritance
WG2 Genetic variation of adaptive significance
WG3 Linkage of non-Mendelian inheritance to environmental adaptation

Non-COST participation: Canada, China, Japan, Russia, Ukraine, USA

Action BM1103

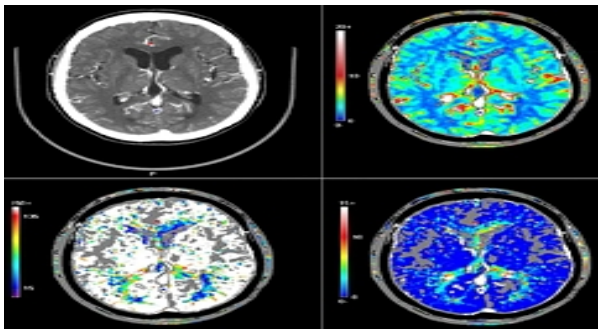
Arterial spin labelling Initiative in Dementia (AID)

Objectives

The main objective of the Action is to improve and validate the Arterial Spin Labelling MRI technology to permit development as a reliable clinical tool for the diagnosis and follow-up of dementia, providing reproducible and comparable quantitative measurements of cerebral perfusion independent of the hardware manufacturer together with the necessary harmonised post-processing, statistical analysis and cross-validation software to be employed in clinical trials.

Abstract

Dementia is a major clinical challenge with care costs approaching 1% of global GDP. Recent estimates suggest that delaying disease onset by 5 years would halve its prevalence. As new disease-modifying treatments will be specific to causative diseases, expensive and bear significant side effects, early diagnosis of dementia will be essential. Current diagnostic criteria include the use of image-based biomarkers using radiotracers. The AID Action aims at coordinating the development of an alternative and cost-effective tool based on an MRI technique, Arterial Spin Labelling (ASL), to obtain reproducible brain perfusion measurements in dementia patients by bringing together scientists and clinicians from across Europe through the flexibility of the COST mechanism.



Keywords: Magnetic Resonance Imaging, Arterial Spin Labelling, Cerebral Blood Flow, Dementia, Biomarker

Working Groups

WG1 ASL data acquisition
WG2 ASL data analysis
WG3 Clinical validation of ASL in cognitive impairment
WG4 Establishment of ASL-derived CBF as a biomarker

Action BM1104

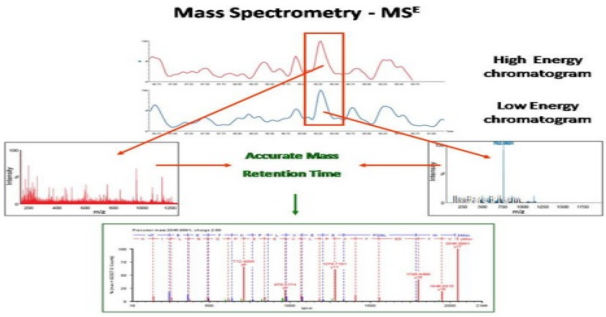
Mass Spectrometry Imaging: New Tools for Healthcare Research

Objectives

The main objective of the Action is to establish imaging mass spectrometry and related translational technologies in clinical research. It will lead to standardized protocols for describing tissues by their molecular content and distribution, which will then be exploited to develop new molecular histological signatures for improved disease diagnosis as well as new methods for quantitative imaging of lead formulations for pharmaceutical development.

Abstract

Mass spectrometry imaging is a rapidly developing technique that uses spatially resolved proteomic and metabolomic techniques to simultaneously trace the distributions of hundreds of biomolecules directly from patient tissue samples. Using essentially the same technology peptides, proteins, pharmaceuticals and metabolites can be analyzed, without a label and without prior knowledge. The driving force behind the high and increasing popularity of imaging mass spectrometry is its demonstrated potential for the determination of new diagnostic/prognostic biomarkers, across several chemical domains, including pathologies of overlapping/identical morphology that cannot be distinguished using established histopathological methods.



Keywords: imaging mass spectrometry, biomarker discovery, cancer, pharmaceuticals, diagnosis

Working Groups

WG1 Best practice guidelines for imaging MS data acquisition
WG2 Data analysis and data sharing
WG3 Application to topical diseases

TD1101

A Collaborative European Network On Rabbit Genome Biology (RGB-NET)

Objectives

The main objective of the Action is to establish a multidisciplinary and cooperating network of experts in different research areas and applied fields interested in developing new scientific and commercial opportunities, resources and tools from the European rabbit genome and to strengthen and consolidate Europe as a leader in the scientific and economic exploitation of the European rabbit and related species.

Abstract

This COST action will bring together experts in all rabbit research areas and in other complementary research fields (breeders, geneticists, bioinformaticians, physiologists, evolutionists, embryologists, immunologists, industry experts, etc.) in order to facilitate the transition of rabbit genomic information from experimental data into usable benefits and applications by means of networking expertise. Four Working Groups will be focused on (i) the refinement of the European rabbit genome resource and the development of genome-based platforms, (ii) genetic aspects in meat, fur and pet rabbits and biodiversity resources, (iii) the rabbit as a model in basic biology and human diseases and as a tool for biotechnology applications and (iv) genetic and comparative genomic aspects for the study, exploitation and management of wild lagomorphs. The outcome is a coordination of rabbit research activities and a transfer of knowledge which will produce a strong European added value across a broad spectrum of biology research fields.

Keywords: European rabbit, lagomorphs, genome biology, translational research, networking expertise

Working Groups

WG1 Refinement of the European rabbit genome resource and development of genome-based platforms
WG2 Genetics in meat, fur and pet rabbits and biodiversity resources
WG3 The European rabbit as a model in basic biology and human diseases and as a tool for biotechnology applications
WG4 Genetics and comparative genomic aspects for the study, exploitation and management of wild lagomorphs

Non-COST participation: China, Japan, Taiwan, USA, South Africa

Action FA1101

Omics Technologies for Crop Improvement, Traceability, Determination of Authenticity, Adulteration and Origin in Saffron

Objectives

The multidisciplinary network will increase our knowledge of the structural organization of Saffron genome DNA fingerprinting, chemical fingerprinting, proteomics, transcriptomics, and metabolomics. This integrated knowledge will be the basis for the development of Saffron genetic improvement, and the maturity of reliable techniques to combat bio-adulteration and fraud.

Abstract

Saffron is the highest priced agricultural product and a good example of profitability, sustainability, cultural and social values, and high labour demand. This COST Action addresses coordinated research on Saffron -OMICS for crop improvement, traceability, determination of authenticity, adulteration and origin to provide new insights that will lead a sound Saffron Bio-Economy. Amongst others novel genomic tools and modern genetic and breeding approaches for crop improvement in saffron and ornamental crocuses will be exploited; and omics techniques will be developed to detect new-generation biological adulterants in saffron, based on DNA and chemical fingerprintings

Increased knowledge of genetics and physiology of traditional crops through the omics 'revolution' is a need. The development of sustainable rural economies based on High Value Agricultural Products such as Saffron is in synergy with DG SANCO's policies and contributes to the fulfilment of the aim of CAP, which is to guarantee long-term food security, quality, value and diversity of food produced sustainably, and creating local employment.

Keywords: *Crocus sativus* L., Saffron, biodiversity, genetic resources, breeding, genomics, metabolomics, molecular markers, phytochemistry, traceability, adulteration, authenticity, fraud

Working Groups

WG1 Genetics, Genomics & Transcriptomics
WG2 Phytochemistry & Metabolomics
WG3 Molecular and Phytochemical fingerprinting for breeding, traceability, and authenticity
WG4 Dissemination, Project Management & Coordination International outreach

Non-COST participation: Azerbaijan, Egypt, India

Action FA1102

Optimising and Standardising Non-Destructive Imaging and Spectroscopic Methods to Improve the Determination of Body Composition and Meat Quality in Farm Animals. Acronym: FAIM

Objectives

The network will contribute significantly to the optimisation and standardisation of non-destructive in vivo and post mortem imaging and spectroscopic methods for the measurement of body composition and meat quality in major farm animal species, and to facilitation of automation, effective data capture and management on the level of individual animals.

Abstract

The Action aims to optimise non-destructive in vivo (iv) and post mortem (pm) imaging and spectroscopic methods for the measurement of body composition and meat quality (MQ) in major farm animal species and to devise standardised principles of carcass classification and grading (CCG) across countries. These actions are necessary for the development of value-based payment and marketing systems (VBMS) and to meet the urgent need for market orientated breeding programmes. FAIM encompasses collaboration of hard- and software manufacturers with livestock and imaging academic experts to develop required products for implementing the scientific work.
This is essential for achieving the required advances in CCG systems to measure carcass yield and MQ, to meet the industry need for VBMS, and to improve production efficiency throughout the meat supply chain (MSC). FAIM aims also to support EU legislation on individual animal identification through showing the additional benefits of feeding back abattoir data on individual animals for optimising management, breeding and providing phenotypic information which will facilitate future implementation of genome wide selection.

Keywords: farm animals, imaging, carcass quality, meat quality, traceability

Working Groups

WG1 Body composition
WG2 Meat Quality
WG3 Algorithms
WG4 Traceability

Non-COST participation: Australia, Brazil, Canada, New Zealand, USA, Uruguay

Action FA1103

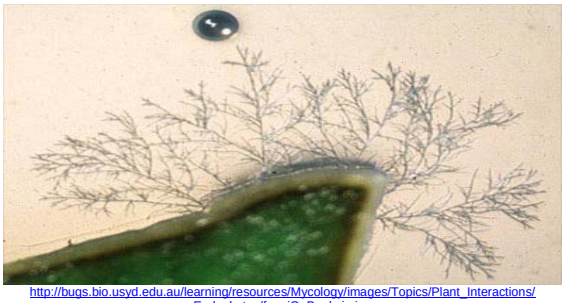
Endophytes in Biotechnology and Agriculture

Objectives

The main objective of the Action is to identify bottlenecks limiting the use of endophytes in biotechnology and agriculture and to provide solutions for the economically and ecologically compatible exploitation of endophytes.

Abstract

Endophytic bacteria and fungi, which live inter- and intracellularly in plants without inducing pathogenic symptoms, interact with the host biochemically and genetically. Endophytic microorganisms (EMOs) may function as plant growth and defense promoters by synthesising phytohormones, producing biosurfactants, enzymes or precursors for secondary plant metabolites, fixing atmospheric nitrogen and CO2 or control plant diseases as well as providing a source for new bioactive natural products with utility in pharmaceutical, agrochemical and other Life Science applications. The use of these EMOs to control plant-pathogenic bacteria and fungi is receiving increasing attention as a sustainable alternative to synthetic pesticides and antibiotics. Furthermore, these EMOs are likely to be adapted to the presence and metabolism of complex organic molecules and therefore show useful biodegradation activities. In order to reduce the input of pesticides and fertilizers and to bring European added value to eco-friendly agriculture, it will be important to develop inocula of biofertilizers, stress protection and biocontrol agents.



http://bugs.bio.usyd.edu.au/learning/resources/Mycology/images/Topics/Plant_Interactions/Endophytes/fungiOnBanksia.jpg

Keywords: Endophytes, plant growth promoters, secondary metabolites, agriculture, plant-microbe-interaction

Working Groups

WG1 Ecology of endophytes
WG2 Identification of new competent endophytes
WG3 Development of new microbial inocula
WG4 New industrial products in life sciences

Non-COST participation: Ukraine, USA

Action FP1101

Assessment, Reinforcement and Monitoring of Timber Structures

Objectives

The main objective of the Action is to increase the confidence of designers, authorities and end-users in the safe, durable and efficient use of timber and consequently increase its acceptance and use in the design of new and in the repair of old buildings.

Abstract

In recent years, the use of timber in structures has become particularly important, considering that it is the only truly renewable building material and carbon storage. Timber has been used as structural material for centuries and numerous examples demonstrate its durability if properly designed and built and when adequate assessment and monitoring has been applied. The objective of the Action is to increase the acceptance of timber in the design of new structures and in the repair of old buildings by developing and disseminating methods to assess, reinforce and monitor them. The need for assessment, reinforcement and monitoring of timber structures can arise from multiple motivations such as the expiration of the planned lifetime, materials aging, exceptional incidents, and ever more important, a change of use. The Action will benefit from multidisciplinary views of the problems and followed innovative solutions by the involved stakeholders, enable synergies between them and provide an effective way of discussing and disseminating the results from ongoing projects within this research area to the European industry. The Action will increase the confidence of designers, authorities and end-users in the safe, durable and efficient use of timber and consequently increase its use in construction.

Keywords: Timber, timber structures, assessment, reinforcement, monitoring

Working Groups

WG1 Assessment of timber structures
WG2 Reinforcement of timber structures
WG3 Monitoring of timber structures.

Non-COST participation: Australia, Canada

Action FP1102

Determining Invasiveness And Risk Of Dothistroma (DIAROD)

Objectives

DIAROD will identify the biosecurity implications and determine the risk of changing behaviour of forest pathogens to aid policy makers, regulators and land managers in the successful management of pathogen outbreaks. This will be achieved using Dothistroma Needle Blight (DNB), a fungal disease of rising profile in Europe, as a model. The Action will encourage, on an international scale, collaboration and the co-ordination of research, data collection and knowledge transfer in order to tackle the fundamental issues.

Abstract

Dothistroma needle blight is an economically important tree disease caused by two fungal pathogens, Dothistroma septosporum and Dothistroma pini. Although the disease has been a problem in the southern hemisphere for many years, only recently has it caused significant damage to plantations and natural forest ecosystems in Europe. The biosecurity implications relating to this recent upsurge are unclear, and this has raised a number of important questions: Are these fungi recently introduced, or is it that they are changing in behaviour, possibly due to changing climatic conditions? Alternatively, is the dramatic increase in disease intensity and geographical and host range due to the introduction of more aggressive strains? Is this situation likely to worsen, or maybe improve under future management and climate change scenarios? What are the most suitable management strategies? This Action, DIAROD, plans to build on the foundations of the International Dothistroma Alliance (IDA), established in 2006 to help combat the new problems faced due to this disease. The aim of the DIAROD cost Action is to synthesize knowledge, encourage collaborative research to address the key questions, determine future research priorities, and use the resulting information to develop management strategies applicable to this evolving disease and other future disease threats.

Keywords: Dothistroma needle blight, biosecurity and pest risk analysis, invasive organisms, climate change, forest management

Working Groups

WG1 The pathogen: Defining the current disease situation.
WG2 The environment: Determining the risk of DNB
WG3 The host: Resistance and susceptibility
WG4 Identify knowledge gaps, disseminate findings and provide best practice guidance for the management of DNB

Non-COST participation: Belarus, Canada, New Zealand, Russia, South Africa, Ukraine

Action CM1101

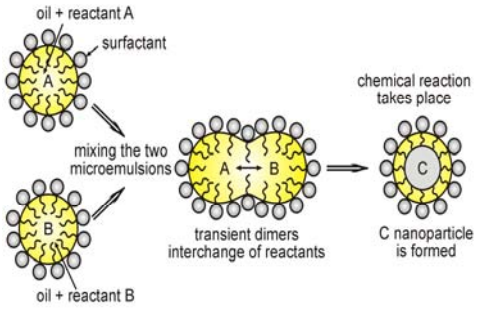
Colloidal Aspects of Nanoscience for innovative Processes and Materials

Objectives

This Action will contribute to provide a platform for cooperation and coordination in the European colloid-science domain directed towards development of innovative materials and processes.

Abstract

Colloid chemistry is a steadily growing field of immense importance. The enormous diversity of the colloidal processes involved in novel materials and their applications in both advanced technologies and everyday life cannot be overstated. There is a compelling need for exchange, coordination and cooperation in the European colloid community. This Action will combine coherently the outstanding European expertise in this field, including: theoretical modelling and experimental formation of functional and patterned interfaces; self-assembly of molecules and colloidal particles; synthesis and up-scaling of novel nano-colloidal and bio-colloidal materials; the kinetic and catalytic aspects of these novel materials; and their applications in chemical, pharmaceutical and food industries, as well as in nano-devices such as sensors, assays, photonics and bio-fuel cells. This includes many of the Grand Challenges in energy, health and environmental protection. The Action will provide a platform for coordination of national programs and will stimulate academia-industry cooperation. The Action's main deliverables will be the increased networking in colloid chemistry through the organization of scientific events (conferences, workshops), training schools and STSMs. Through an extensive mobility program targeted to early-stage researchers, it will encourage their involvement in the research at the international level.



Keywords: colloids, interfaces, nanoparticles, nanostructures, interactions

Working Groups

WG1 Interfacial phenomena – fundamentals, modelling and analytical methods
WG2 Self-assembly and colloidal interactions: from specific to long-range
WG3 Synthesis of nano- and bio-colloidal materials: development and up-scaling
WG4 Kinetic and catalytic aspects of nano-colloids and nano-structured surfaces
WG5 Processes and materials for everyday life and biomedical applications
WG6 Colloid-based devices: sensors, assays, photonics and micro-fluidics

Non-COST participation: Australia, China, Egypt, India, Palestine, Russia, Ukraine

Action CM1102

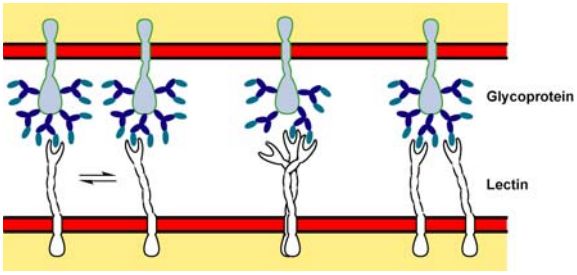
Multivalent Glycosystems for Nanoscience - MultiGlycoNano

Objectives

The main objective of the Action is to develop novel nanoscale glycoconjugates suitable for biomedical applications.

Abstract

Carbohydrates constitute the most abundant class of biomolecules on Earth. They have diverse biological roles ranging from energy storage to mediating interactions between living cells. Carbohydrates that are attached to proteins, lipids and synthetic multivalent scaffolds (i.e. glycoconjugates) can be used as anti-adhesive drugs against bacteria or viruses, or bioimaging agents that can target specific tissues. However, they can also have applications in materials science as nanoscale building blocks for hydrogels and templates for making nano-structured hard materials. The Action aims to build a dynamic network across Europe focused on developing glycoconjugates for nanoscience applications. The network will develop new methods for producing nanomaterials for applications in drug delivery, in gene targeting and as diagnostic/prognostic tools. The Action will foster new collaborations to transform glycoconjugate research in Europe by establishing a new frontier at the interface with nanoscience.



Keywords: Glycoconjugates; carbohydrates; nanoscience; nanoparticles; multivalency

Working Groups

WG1 Glycoconjugates for drug/gene delivery
WG2 Glycoconjugates for diagnostics
WG3 Vaccines/modulators of the immune system
WG4 Glycoconjugates as anti-pathogenic agents

Action CM1103

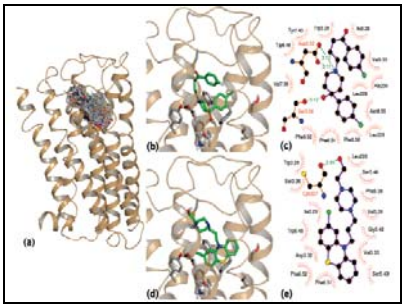
Structure-based drug design for diagnosis and treatment of neurological diseases: dissecting and modulating complex function in the monoaminergic systems of the brain

Objectives

The main objective of the Action to forge interdisciplinary collaborations that will build the capacity to design chemical tools to diagnose and treat the pathology underlying neuropsychological disorders including dementia.

Abstract

The therapy of neuropsychiatric disorders is limited by the high variability of symptoms and behavioural disturbances. Few drugs are available to address specific subsets of neurological/mental symptoms and none to aid in diagnosis or to stop the progress of neurodegenerative disorders. Neurotransmitters such as dopamine and serotonin play a central role in the pathophysiology of major neuropsychiatric illnesses, such as anxiety and mood disorders, schizophrenia, autism-spectrum disorders, Parkinson's disease, epilepsy, and dementias. Neurotransmitter-binding proteins such as receptors, transporters and common metabolic enzymes are the starting points for development of tools to diagnose and drugs to treat specific clusters of symptoms. Structure-based drug design, synthetic chemistry and biological characterisation will inform the choice of lead compounds to treat select subsets of brain malfunction. This Action will facilitate the cross-disciplinary interaction for discovery of promiscuous drugs for diagnosis and treatment of complex brain diseases. In addition to addressing a clinical need, bringing together academic scientists with a broad range of techniques and knowledge, this close collaboration will enrich interdisciplinary scientific training to design chemical tools for neuropathology across Europe, and provide lead compounds with the potential for transfer to the European pharmaceutical industry.



Keywords: Structure-based drug design, computational and synthetic chemistry, monoamine receptors, transporters and metabolic enzymes, neurodegenerative and psychiatric disorders

Working Groups

WG1 Computational chemistry
WG2 Medicinal chemistry
WG3 Molecular & cellular biology
WG4 Therapeutic potential

Non-COST participation: Australia, USA

Action TD1102

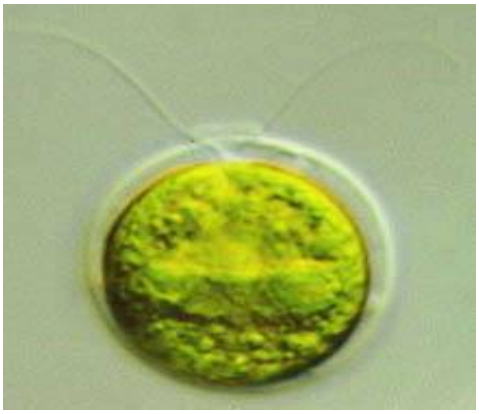
Photosynthetic proteins for technological applications: biosensors and biochips (PHOTOTECH)

Objectives

This Action will contribute to promote a new research platform devoted to design and production of robust and reliable bioelectronic devices based on new photosynthetic elements to develop bio-organic-inorganic hybrid biosensors for environmental monitoring.

Abstract

By converting solar energy into chemical energy, photosynthesis supports basically all life on Earth. Key to this process is the use of light energy to power electron transfer across a charge-impermeable lipid membrane. In recent years the nanoscale photosynthetic pigment-protein complexes catalysing this reaction have been isolated and interfaced with metal or carbon electrode surfaces. The activity of these proteins when integrated with non-biological electronic components can be monitored through their highly distinctive absorbance and fluorescence properties, and through the measurement of light-induced photocurrents. Moreover, the structure and composition of these proteins can be altered through genetic engineering. These tools can be exploited for the construction of optoelectronic devices and mono- and/or multi-molecular layers of either natural or engineered proteins for the development of commercial biosensors and biochips.
The objective is to explore, interface and merge the various aspects of photosynthesis -based biodevices development that provide a complementary innovative tool to traditional analytical chemical methods. The purpose will be the creation of a new research platform for the Design and Production of Bioelectronic Devices whose main outcome will be the co-development of a fully characterized class of bio-organic-inorganic hybrid biosensors to be first applied in environmental and agro-food monitoring.



Keywords: photosynthetic protein biochip, hybrid layer, immobilization, genetic engineering, biosensor

Working Groups

WG1 Photosynthetic Biomediator Selection and Engineering
WG2 Biomediator Immobilization
WG3 Biosensor Manufacture
WG4 Components and System Characterization

Action ES1101

HarmBio - Harmonizing Global Biodiversity Modelling (HarmBio)

Objectives

The main objective of this Action is the harmonization of current models and datasets of terrestrial, freshwater and marine biodiversity to improve the reliability of future projections of biodiversity change under various policy options enabling environmental decision making.

Abstract

Global biodiversity is declining rapidly, largely as a result of human activities. Effective policy and adaptive management strategies in the face of global change require anticipation of future changes. Mid- to long-term planning will therefore depend, at least in part, on model-based projections. Unlike the well-coordinated climate modelling community, the biodiversity modelling community is currently disparate and largely uncoordinated. Hence, there are no agreed metrics of biodiversity produced as standard output from models, nor are there common datasets used for calibration and validation by modelling efforts. This Action facilitates the harmonization of current models and datasets of terrestrial, freshwater and marine biodiversity to improve the reliability of future projections of biodiversity change. This cross-community initiative aims to accelerate the development of transparent and scientifically robust biodiversity models, through validation, calibration and intercomparison of models and data, and ultimately to enable environmental decision making based on state-of-the-art projections of biodiversity change under various policy options.

Keywords: global biodiversity modelling, environmental assessments, biodiversity projections, global change

Working Groups

WG1 Consensus on metrics of biodiversity
WG2 Standardised datasets of biodiversity and environment
WG3 Agreed standards for biodiversity models
WG4 Inter-comparisons of biodiversity models

Non-COST participation: Australia, Canada, USA

Action ES1102

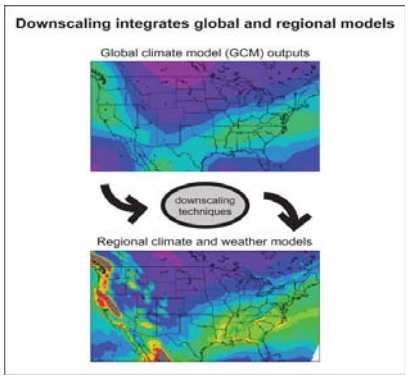
VALUE - Validating and Integrating Downscaling Methods for Climate Change Research

Objectives

The main objective of the Action is to establish a network to systematically validate and improve downscaling methods for climate change research. The Action will assess the skill of various downscaling methods to represent temporal variability from sub-daily to decadal time scales including climate change; extreme events; spatial coherence and variability; and inter-variable consistency together with the related uncertainties. VALUE will in particular deliver an assessment of end user requirements, an inventory of downscaling methods, a set of validation measures and tailed guidelines for the use of downscaling methods. The validation will ultimately guide the development of improved local and regional-scale climate change scenarios for Europe for the 21st century, based upon the best performing downscaling methods.

Abstract

Our understanding of global climate change is mainly based on General Circulation Models (GCMs) with a relatively coarse resolution. Since climate change impacts are mainly experienced on regional scales, high-resolution climate change scenarios need to be derived from GCM simulations by downscaling. Validation of downscaling methods is crucial, but several aspects have not been systematically assessed: variability on sub-daily, decadal and longer time-scales, extreme events, spatial variability and inter-variable relationships. Different downscaling approaches such as dynamical downscaling, perfect prog statistical downscaling and model output statistics have not been systematically compared. Furthermore, collaboration between different communities, in particular regional climate modellers, statistical downscalers and statisticians has been limited. VALUE will provide a European network to validate and develop downscaling methods and improve the collaboration between the dispersed research communities and with stakeholders. The Action will sytematically compare the different downscaling approaches and assess the aspects listed above. VALUE will deliver an assessment of end-user needs, a benchmark data set and pseudo reality for the validation, a set of validation measures, the validation of state-of-the-art methods and guidelines for stakeholders. It will guide the development of improved regional climate change scenarios for Europe and thereby be relevant for European societies and politics.



Keywords: Regional Climate Change; Regional Climate Models; Statistical Downscaling; Bias Correction; Validation; Pseudo Reality; Extreme Events; Sub-Daily Variability; Decadal Variability; Spatial Coherence; End User Needs

Working Groups

WG1 Synthesis & Stakeholders
WG2 Benchmark data set & pseudo reality
WG3 Spatio-temporal variability Inter-variable relationships
WG4 Extremes
WG5 Sub-daily scales

Action ES1103

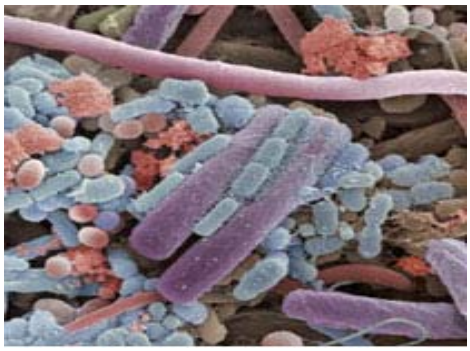
Microbial ecology & the earth system: collaborating for insight and success with the new generation of sequencing tools

Objectives

The main objective of the Action is to lay the foundation for the systematic exploration of microbial diversity in the European Union by creating catalytic and synergistic interactions between the myriad individual national and transnational studies of microbial diversity using next generations sequencing and the skills of advanced theoreticians and other numerate scientists across Europe. The Action will secure or increase the quality of each individual study, ensuring that data is gathered, analysed and curated to agreed standards so that the results can be pooled and compared to generate new and collective theoretical insights and deeper and wider map of this frontier in Science.

Abstract

The microbial world is a vast frontier of intrinsic scientific importance and profound practical importance. The exploration of this frontier has been revolutionised by the introduction of molecular techniques. However, recent advances have only served to emphasise the enormity of the task before us. The improvements in sequencing technology have enormous implications for those at this frontier. Nevertheless description of this huge resource and the discovery of the rule governing its occurrence transcend the ability of not simply any one research group, but of any one nation. The purpose of this Action is to coordinate research groups across Europe to meet this challenge in the belief that if we agree upon common protocols and procedures we will share and pool knowledge to create a whole which is far greater than the sum of the parts. The Action will not only seek to document this frontier but to analyse it, to seek patterns, generate hypotheses and to test theories and thus deepen our knowledge. Perhaps most importantly of all, we will be preparing and enabling the next generation of researchers to use the next generation of technologies to ensure that Europe can lead the world in the exploration of this frontier.



Keywords: Microbial diversity, Pyrosequencing, massively parallel sequencing Pyronoise, bioinformatics, metagenomics, mathematical modelling

Working Groups

WG1 Data Generation Protocols
WG2 The analysis of raw data for diversity estimates
WG3 The analysis of raw data for metagenomics, RNA expression and beyond
WG4 Data comparison pooling and exploration
WG5 Towards a systematic survey

Action MP1101

Bio-Plasma - Biomedical Applications of Atmospheric Pressure Plasma Technology

Objectives

Bio-Plasma will intensify the knowledge base relevant to medical and biomedical applications of atmospheric pressure plasma technology within Europe, and raise the general awareness of the potential of this technology via the establishment of a communication platform. The network will look towards early exploitation of plasma treatment techniques with enormous potential for patient care, particularly to reduce infection, enhance the speed of wound healing and treat cancer.

Abstract

Providing health care at tolerable cost is one of the greatest challenges facing the world in this century. Technologies that may offer enhanced quality of care at reduced cost, such as plasma technology, will be of immense societal and commercial value. This Action will focus on medical and biomedical applications of low-temperature, non-thermal atmospheric pressure plasmas, in fields including surface treatment of biomedical devices, sterilisation, and therapeutic techniques, such as wound sterilisation and cancer treatment. This is an interdisciplinary topic, involving clinicians, biologists, chemists and physicists, together with industrialists ready to exploit the results. The collective purpose of the participants in this Action is to develop synergistic links between their research programmes, and to take full advantage of the opportunities that follow to create a leadership position for Europe in this important emerging area.

Keywords: Plasma technology, biomedical applications, biofilms, sterilisation, therapeutic techniques, tumour suppression, biomaterials, plasma diagnostics, plasma chemistry, surface morphology, chemically functional surfaces

Working Groups

WG1 Plasma therapeutics
WG2 Functional coatings for biomaterials
WG3 Bio-plasma interactions
WG4 Plasma sources for biomedical applications

Non-COST participation: Australia, Canada, Japan, Russia, USA

Action MP1102

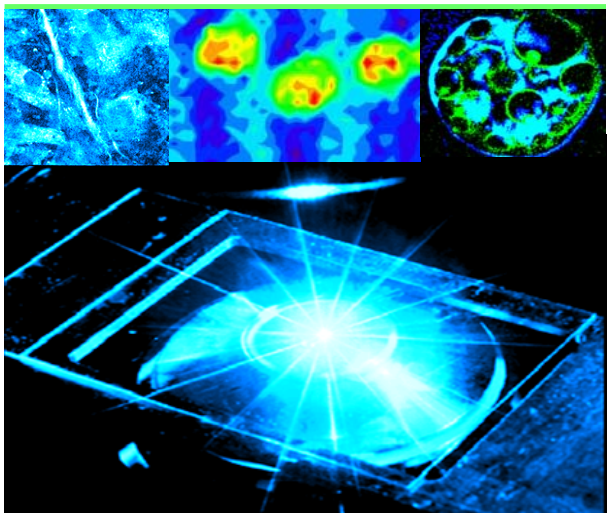
microCoR – Chemical imaging by Coherent Raman Microscopy

Objectives

The aim of the Action is to establish active scientific exchange between European experts for the development and use of Coherent Raman (CoR) microscopy.

Abstract

The aim of the proposed Action is to establish active scientific exchange between European experts for the development of the emerging category of Coherent Raman (CoR) microscopy techniques – the optical correspondent to MRI, enabling non-invasive tomographic imaging of molecular species in innovative materials and living matter with high specificity at sub-wavelength resolution by probing natural molecular vibrations. Specifically we intend to: (i) offer networking opportunities for the scientific and technical communities of laser instrumentation, microscopy, spectroscopy, and ultrafast optics for efficient development of the broad range of technologies required for CoR microscopy; (ii) reach out to potential users within the material-, nano-, chemical-, bio- and life sciences to push CoR microscopy beyond proof-of-principle measurements, and (iii) to attract the interest of the next generation of promising scientists by outreach activities and thereby ascertain that Europe remain at the frontline of microscopy research in the increasing competition from Asia and America.



Keywords: molecular microscopy, nonlinear optics, vibrational spectroscopy, sub-diffractive imaging, soft- and living-matter characterization

Working Groups

WG1 Fundamentals and technical development
WG2 Applications within the material- nano- and chemical sciences
WG3 Applications within the bio- and life sciences

Action MP1103

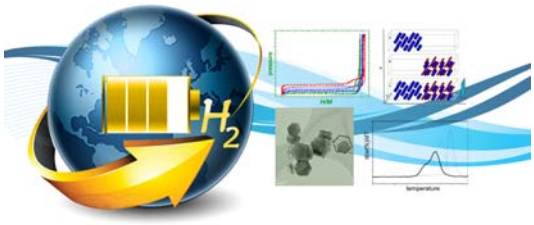
NANOSTHYS - Nanostructured Materials for Solid-State Hydrogen Storage

Objectives

NANOSTHYS will develop innovative nanostructured materials that meet the targets for practical Solid-State Hydrogen Storage, creating the conditions for their adequate implementation in stationary and transport applications to sustain in medium-long terms the economies of European countries. Establishment of a pan-European and multidisciplinary research and communication platform that can develop the science and technology potential of SSHS, thus contributing actively to the regional and European economy and social welfare.

Abstract

NANOSTHYS deals with the future of energy storage and aims to set up a competitive and coordinated network capable to define new and unexplored ways for Solid-State Hydrogen Storage (SSHS) by innovative and interdisciplinary research. NANOSTHYS focuses on SSHS in light-weight nanostructured materials to discover novel guidelines and phenomena for the design of advanced SSHS systems exploiting synthesis techniques, structure analysis and computer simulations. The final goal is the development of SSHS materials with tailored properties that find practical implementation in transportation and energy sectors. NANOSTHYS contributes to form a critical mass of researchers in the field of SSHS materials, in order to overcome the present bottlenecks for their widespread industrial application.



Keywords: Hydrogen storage, nanostructured materials, high sensitivity characterization methods, computational simulations, stationary and transport applications

Working Groups

WG1 Synthesis of novel materials with optimized properties
WG2 High resolution and high sensitivity characterization of atomic level structure and of microstructural features
WG3 Characterization of hydrogen storage properties both at the laboratory level and at the scale of prototype tanks
WG4 Computational modeling of processes relevant to SSHS

Non-COST participation: Australia, Canada, India

Action MP1104

Polarization as a tool to study the Solar System and beyond

Objectives

To promote polarimetry to advance knowledge about astrophysical objects within the Solar System and beyond.

Abstract

Polarization of light is a key observable to access essential information that lies encoded in the electromagnetic radiation reaching us from astronomical objects. Polarimetry is a powerful observational tool that complements the capabilities of imaging, photometry and spectroscopy in many fields of planetology and astrophysics.

In most research fields, notwithstanding some outstanding results, polarimetry is still too often overlooked. This Action will aim at promoting polarization as an invaluable tool to obtain a wealth of information about astrophysical bodies in our Solar System and beyond. With the benefit of the COST legitimacy, the Action will recommend to the European Space Agency, the European Southern Observatory, national space agencies, European industry and policy makers the development and addition of polarimeters in future ground-based observatories and space missions.

The current state of European polarization research faces a lack of interaction between communities working on different objects and/or in different wavelength domains. The Action will set up the first network of polarization experts in many disciplines and over a wide range of the electromagnetic spectrum, foster multi-wavelength and cross-disciplinary collaborations, and make Europe the world leader in all fields of polarimetric science.

Keywords: Polarization, planetology, astrophysics

Working Groups

WG1 Theory and modeling
WG2 Observations
WG3 Instrumentation
WG4 Experimentation

Non-COST participation: Argentina, South Africa, Ukraine, USA

Action TD1103

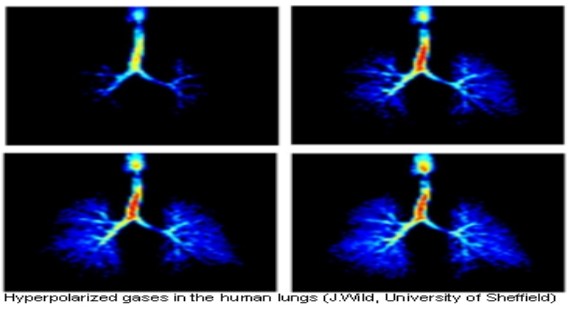
European Network for Hyperpolarization Physics and Methodology in NMR and MRI

Objectives

The main objective of the Action is to develop and optimize robust strategies for the generation of spin hyperpolarization that provide a dramatic sensitivity increase of NMR spectroscopy and MR imaging experiments for a wide range of applications including medical diagnostics, molecular dynamics and structural investigations of biomolecules.

Abstract

Nuclear Magnetic Resonance (NMR) spectroscopy, microscopy and imaging techniques (MRI) play a crucial role in numerous fields of science ranging from physics, chemistry, material sciences, biology to medicine. However, despite all their versatility, the key issue is frequently sensitivity, which limits the applicability of NMR spectroscopy and imaging techniques in the case of fast dynamical processes and detection of low concentration molecules in both *in vitro* and *in vivo* applications. The Action aims to stimulate and accelerate collaborations and joint research efforts between European groups into hyperpolarization physics and methodology with the goal to develop robust strategies for sensitivity enhancement in NMR and MRI.



Hyperpolarized gases in the human lungs (J.Wild, University of Sheffield)

Keywords: Hyperpolarization, Nuclear Magnetic Resonance, Magnetic Resonance Imaging, Dynamic Nuclear Polarization, Sensitivity Enhancement

Working Groups

WG1 Hardware and instrumentation for hyperpolarization
WG2 Theoretical understanding of hyperpolarization strategies
WG3 Strategies to minimise the effect of relaxation on spin hyperpolarization
WG4 Strategies to maximise the information that can be acquired using hyperpolarized spin systems
WG5 Synthetic chemistry - physics interface in hyperpolarization methodology

Non-COST participation: New Zealand, Russia

Action IS1101

Climate Change and Migration: Knowledge, Law and Policy, and Theory

Objectives

The Action aims to enhance and improve understanding of climate change-induced migration by coordinating social science research activities across three related areas of investigation: knowledge, law and policy, and theory. This will be achieved by synthesizing existing knowledge across these three areas, advancing innovative interpretative frameworks, stimulating innovative questioning, methodologies and research, promoting specific projects, and disseminating the research to the widest possible array of stakeholders, including through peer-reviewed publications, a working paper series and direct engagement with policymakers through workshops and at least one side-event at a major UN conference. In addition, the Action will provide stakeholders with state-of-the-art research on climate change and migration and will inform the policy dialogue by addressing policy audiences at various levels, including the European Commission, national governments and international bodies.

Abstract

This Action brings together a diverse ensemble of established and early-stage social scientists to build upon and extend existing social science research into climate change and migration across three interrelated fields of investigation: knowledge; law and policy; and theory. The Action has five objectives: to enhance our understanding of climate change and migration; to provide state and non-state actors with state-of-the-art empirical, theoretical, legal and policy research on climate change and migration; to inform the national and international policy dialogue, such as the IPCC and other policy initiatives; to expand research capacity in the area of climate change and migration; and to establish a network of Europe-based social science researchers working on climate change and migration.

Keywords: migration, ethnicity, health, policy, implementation

Working Groups

WG1 Empirical and methodological research issues specific to migration and climate change (computer modeling, remote sensing, field research and ethnography)
WG2 Law and policy at the sub-national, national and international scales (policy sectors include immigration, development, humanitarian, environmental and security policy)
WG3 Theoretical aspects of climate change and migration

Non-COST participation: Australia, Canada, India, International Organization for Migration

Action IS1102

SOCIAL SERVICES, WELFARE STATE AND PLACES. The restructuring of social services in Europe and its impacts on social and territorial cohesion and governance (SO.S.COHESION)

Objectives

The aim of the Action is to share and compare knowledge about the features and effects of the recent restructuring of social services in different national/regional contexts from five points of view: efficiency; democratic governance; social and territorial cohesion; the labour market; gender, with a view to identifying regulatory conditions, organisational configurations, and actual practices that maximise benefits from some or all mentioned points of view, thereby contributing recommendations to establish basic common European social policy guidelines. Among social services, the Action will especially focus on care services. This general objective will be pursued by building a flexible and open network for the structured exchange of comparative knowledge, analytical methodologies and research findings.

Abstract

In the last 20 years social services have experienced significant restructuring throughout Europe (involving cuts in public funding, devolution to local governments, externalisation to private providers). The fiscal crisis of states (on the supply side) and the need to ensure greater efficiency, wider consumer choice and more democratic governance (on the demand side) are among the reasons for such changes. The recent global financial crisis and the awareness that social services are a major vehicle of social and territorial cohesion have brought social services back on the EU agenda. The COST frame will allow existing knowledge to be shared and valorised within a structured comparative framework, with a view to disseminating findings at the local and international scale and to identifying inputs for a European social policy platform.

Keywords: Social services, welfare regimes, restructuring, social and territorial cohesion, social innovation.

Working Groups

WG1 Comparison of regulatory frameworks and organizational trajectories in social services.
WG2 Analysis of the effects of changes in care services.
WG3 Comparative assessment of good practices, to provide policy inputs.

Action IS1103

Adapting European health systems to diversity (ADAPT)

Objectives

The aim of ADAPT is to identify obstacles to translating into action the existing body of knowledge concerning health and health-care inequalities among migrants and ethnic minorities, and to propose ways of overcoming these obstacles. Deliverables will in most cases consist of publications. As a means to ensure the influence of the Action on policy, policy makers and health service managers will be invited to participate to Action meetings, together with representatives of migrant and ethnic minorities. One or more conferences will be held to disseminate the results of the Action.

Abstract

European societies are becoming ethnically and culturally more diverse, yet their health systems are failing to keep pace. This Action aims to promote the adoption and implementation of policies responding to this increased diversity. It builds on the achievements of COST Action IS0603 Health and Social Care for Migrants and Ethnic Minorities (HOME), which reviewed health inequalities among migrants and ethnic minorities as well as the measures designed to remedy them. ADAPT will take this work forward, identifying obstacles to translating this knowledge into action as well as 'levers for change'. Interdisciplinary teams will identify bottlenecks and missed opportunities, while the pan-European nature of COST will provide a unique opportunity to identify the factors driving policy and implementation. The results will have implications for effective policy making and organisational change, not only in health but also in other fields of public policy.

Keywords: migration, ethnicity, health, policy, implementation

Working Groups

WG1 Reviewing policies and their implementation in each country and investigating the sources of variation in policies and practices
WG2 Strengthening the evidence base, strategies for organizational change, public health principles and professional standards and user involvement
WG3 Human rights arguments and policies concerning migration and diversity
WG4 Economic arguments and socio-economic inequalities

Non-COST participation: International Organization for Migration, World Health Organization

Action IC1101

Optical Wireless Communications - An Emerging Technology (OPTICWISE)

Objectives

The aim of OPTICWISE is to increase the scientific understanding and technical knowledge of the emerging field of OWC by exploring and developing novel methods, models, techniques, strategies and tools in infrared, visible and ultraviolet spectral bands that will facilitate the implementation of future generations of OWC systems. The resulting high-performance, high-reliability, ultra-fast, power-efficient, and low-cost OWC systems are envisioned as an indispensable part of a future wireless eco-system. OPTICWISE will help establish OWC as a mature communication technology and present a powerful alternative and/or complement to existing technologies in a diverse range of communication applications. OPTICWISE will serve as an internationally recognized reference point through capacity building of OWC stakeholders. It will educate and influence decision makers at all levels of the OWC market chain and lead trends in emerging OWC applications to increase the awareness on OWC. It will also provide training opportunities for graduate students and early-stage researchers (ESRs).

Abstract

Wireless transmission via optical carriers opens doors of opportunity in areas as yet largely unexplored. Offering significant technical and operational advantages, optical wireless communication (OWC) can be, in some applications, a powerful alternative to and, in others, complementary to existing radio frequency (RF) wireless systems. Variations of OWC can be employed in a diverse range of communication applications ranging from very short-range (on the order of millimetres) optical interconnects within integrated circuits through outdoor inter-building links (on the order of kilometres) to satellite links (larger than 10,000 kilometres). In many respects, OWC research is still in its infancy and calls for extensive research to begin to harness the enormous potential of the optical spectrum. This COST Action will serve as a high-profile consolidated European scientific platform for interdisciplinary OWC research activities, spanning from characterization of diverse propagation media to modelling, design and development of devices, components, algorithms/protocols and systems. It will make significant contributions to the fundamental scientific understanding, technical knowledge, engineering design and applications while promoting community awareness of this emerging field. Development of novel and efficient communication technologies resulting from integrated research activities made possible through this Action will be a significant enabler for future-generation heterogeneous communication networks supporting a wide range of wireless services/applications.

Keywords: Optical Wireless Communication, Wireless Communication Technologies, Propagation Modelling and Channel Characterization, Physical Layer Algorithms and Networking Protocols, Photonic Components

Working Groups

WG1 Propagation Modelling and Channel Characterization
WG2 Physical Layer Algorithm Design and Verification
WG3 Networking Protocols
WG4 Advanced Photonic Components

Action IC1102

Versatile, Integrated, and Signal-aware Technologies for Antennas (VISTA)

Objectives

The main objective is to assist and coordinate research in the field of integrated and versatile antennas for wireless applications, by bringing together experts from the distinct areas of radio, RF and microwave engineering, as well as related topics such as signal processing or (micro) fabrication techniques. This will foster the development of innovative radiating systems devoted to communication and sensing, as well as their supporting technologies.

Abstract

Communications and sensing in varying wireless environments require resilient, adaptive antenna systems for reliable data transmission and seamless access to various infrastructures. The emergence of new technologies in radio coding and the need for more efficient use of the spectral and energy resources shifts antenna system design towards cross-disciplinary approaches, covering electromagnetic field theory, RF engineering, signal processing, integrated fabrication technologies and even micro- and nano-technologies. With these new challenges, it is vital to review the existing expertise and direct efforts in the right direction. This Action identifies key research topics, facilitating the networking and coordination between different R&D teams. The objectives are to assess the needs for new technologies and applications, to foster the development of radiating systems in green, smart environments, to provide the necessary supporting technologies and to promote the career start of young researchers.

Keywords: Antennas & sensors, enabling & supporting technologies, energy efficiency, situation aware embedded devices, reconfigurable & agile frontends

Working Groups

WG1 Application & requirements for future wireless systems
WG2 Enabling technologies and integration
WG3 Supporting technologies: modelling and characterisation
WG4 Societal aspects and ESR support

Action IC1103

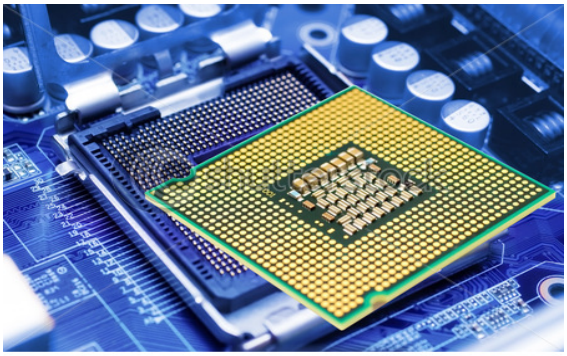
Manufacturable and Dependable Multicore Architectures at Nanoscale

Objectives

The aim is to create a strong network of European competences and expertise on design, manufacturing, testing, and validation issues of dependable multicore processors at nanoscale, promoting collaboration between industry and research.

Abstract

Constant advances in manufacturing yield and field reliability are important enabling factors for electronic devices pervading our lives, from medical to consumer electronics, from railways to the automotive and avionics sectors. At the same time, both technology and architectures are today at a turning point; many ideas are being proposed to postpone the end of Moore's law such as extending CMOS technology as well as finding alternatives to it like CNTFET, QCA, memristors, etc, while at the architectural level, the spin towards higher frequencies and aggressive dynamic instruction scheduling has been replaced by the trend of including many simpler cores on a single die. These paradigm shifts imply new dependability issues and thus require a rethinking of design, manufacturing, testing, and validation of reliable next-generation systems. These manufacturability and dependability issues will be resolved efficiently only if a cross-layer approach that takes into account technology, circuit and architectural aspects will be developed.



Keywords: Manufacturability, reliability, dependability, fault tolerance, nanoscale, testing, multicore architectures

Working Groups

WG1 Methodologies and techniques for manufacturing reliable nanoscale devices
WG2 System level design, on-line testing/fault tolerance
WG3 Verification and Validation/Debug Methodologies
WG4 Fault tolerance for space applications
WG5 Fault tolerance for transportation systems
WG6 Fault tolerance for medical devices

Non-COST participation: USA

Action TU1101

Towards safer bicycling through optimization of bicycle helmets and usage

Objectives

The main objectives of this Action is to increase scientific knowledge concerning bicycle helmets in regards to traffic safety and to disseminate this knowledge to stakeholders, including cyclists, legislators, manufacturers, and the scientific community. An additional aim is to stimulate international collaboration within the domain of this Action. The Action focuses on head protection in the event of an accident and also on preventing accidents from occurring. The participation of experts in the primary scientific fields dealing with helmet function and bicycle traffic safety, on a European scale, is the basis of this unique, integral approach.

Abstract

Cycling is an excellent sustainable alternative to driving for many journeys. However, cyclists have fewer safety options than car-users, with a helmet being the main safety device that is available. Nonetheless, there are strong indications that increasing bicycle helmet usage for cyclists through legislation causes confounding factors which might cancel out the positive effect of helmets on head and brain injury. Furthermore, current helmet design is suboptimal. Since several fields are important to bicycle helmet optimization, a combined effort involving all of these is necessary so that a given parameter is not optimized at the cost of another. Finally, the attitudes of cyclists towards helmets must be considered if helmet usage is to be changed. This multidisciplinary approach respects the complex nature of the issue, is unique in Europe, and will provide more complete information to legislators, manufacturers, end-users, and scientists, ultimately leading to increased safety for cyclists.

Keywords: Bicycle helmets, In-depth accident observations and injury statistics, Traffic psychology, Impact engineering, Ergonomics

Working Groups

WG1 In-depth accident observations and injury statistics
WG2 Traffic psychology
WG3 Impact engineering
WG4 Ergonomics of thermal aspects

TU1102

ARTS - Towards Autonomic Road Transport Support Systems

Objectives

ARTS will unite and align groups from transport studies, computer science and engineering into a world leading research community that will develop radically new ways of designing road transportation support systems based on the ideas of autonomic systems.

Abstract

A current, well recognised societal problem is the frequent failure of road transportation networks, resulting from traffic incidents, system overloading and lack of optimised support systems. If used as a platform on which to implement leading edge road transport support (RTS) technologies, Autonomic Systems have the potential to deliver savings in the cost of system configuration, maintenance, and infrastructure, while potentially improving network efficiency and reducing the chances of human error. Using an autonomic approach to RTS is a novel and very ambitious idea requiring interdisciplinary community building, hence the need for a European-wide network. This Action will bring together disparate strands of research into an integrated discipline, putting Europe at the leading edge of autonomic RTS development, and will deliver a transformative change within the field of autonomic systems.

Image by permission of Pedro Miguel Cruz, P. Machado, J. Bicker

Keywords: Intelligent Transportation Systems, Road Transportation Support, Autonomic Systems

Working Groups

WG1 Architecture, Methods and Models
WG2 Exploiting the results of previous research and technological development
WG3 External Factors, Environmental Benefits and Application Scope
WG4 Human Interaction and Human Factors

Action TU1103

Operation and safety of tramways in interaction with public space

Objectives

The main objective of the Action is to improve tram and Light Rail Transit (LRT) safety, through a better management of their insertion in urban spaces, and therefore to minimize accidents and their impacts on both transport system and society.

Abstract

The Light Rail Transit (LRT) is spread in many countries all over the world, and particularly in Europe. Some historical networks have a very long experience and others are (re)discovering LRTs with a high disparity in terms of institutional and economic contexts, safety management, operational monitoring and technical choices.
In this context, the Action aims at improving LRT safety and reducing the impact of their conflicts with other public space users. This can be achieved by sharing European experiences on LRTs' accidents and their interaction with public space, practices and operating methods, taking into account the different cultural and historical contexts. Through exchanges with other LRT specialists on available data and results, analysis and comparisons on accident and incident data, the Action will allow to give the greatest safety benefits at best costs.
This Action is built on a bottom-up approach in order to give practical results and solutions to operators and authorities. Beyond internal exchanges, communication and dissemination of outcomes by various means (guidelines, recommendations, website…) will allow to reach most concerned actors at the European level. It will also encourage a common approach and possible transpositions of some good practices in a context of internationalisation.

Keywords: light rail transit, tram, safety, urban insertion, accidents

Working Groups

WG1 Institutional and regulatory aspects, data collection (state level) - State of the art and context exploration
WG2 Data collection on accidents (national and local level) - State of the art and context exploration
WG3 Infrastructure design - State of the art and context exploration
WG4 Data collection, monitoring and evaluation tools – Comparison / analysis / best practices ; Prospects and recommendations
WG5 Accident scenarios, tramlines design and operating methods - Comparison / analysis / best practices ; Prospects and recommendations

Participation of Non-COST countries

Life Sciences Cluster

Biomedicine and Molecular Biosciences (BMBS)

Food and Agriculture (FA)

Forests, their Products and Services (FPS)

Natural Sciences Cluster

Chemistry and Molecular Sciences and Technologies (CMST)

Earth System Science and Environmental Management (ESSEM)

Materials, Physical and Nanosciences (MPNS)

Science in Society Cluster

Individuals, Societies, Cultures and Health (ISCH)

Information and Communication Technologies (ICT)

EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

New COST Action proposals

Open Call - collection date 25 March 2011 (OC-2011-1)

183rd CSO Meeting

30 November - 1 December 2011, Brussels

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Science in Society

Individuals, Societies, Cultures and Health (ISCH)

Information and Communication Technologies (ICT)

Transport and Urban Development (TUD)

Action BM1105

GnRH deficiency: Elucidation of the neuroendocrine control of human reproduction

Objectives

The overall aims of the Action are to identify genes and mechanisms responsible for sexual maturation by studying patients with GnRH deficiency, a “prismatic” disease that facilitates insights into the neuroendocrine control of human reproduction; to inform and validate the human research studies by corresponding research in animal and cellular model systems; and to translate the scientific findings into improved patient care, including genetic counselling.

Abstract

The Action will investigate the neuroendocrine mechanisms that are integrated at the hypothalamic level and regulate the complex organ network controlling reproduction. Implicated genes/pathways have been identified through genetic investigations of rare patients with isolated GnRH deficiency, who displays reproductive failure. Despite knowledge of 16 disease genes, multiple additional genes/mechanisms remain undiscovered, requiring higher-order collaborations for full elucidation. Through a collaborative network of physician-scientists and biologists, the Action will deliver: (i) a database with de-identified genetic and phenotypic data on at least 1,000 GnRH-deficient patients, their families, and unaffected controls, (ii) 1 or more disease gene(s) in each patient, and/or 10 or more novel disease genes, (iii) elucidation of newly identified genes’ roles in animal/cell-based systems, and (iv) guidelines for genetic counselling of GnRH-deficient patients based on the emerging disease architecture. Reasons for undertaking the Action in the COST framework are: (i) a critical yet fragmented mass of experts exists across Europe, (ii) participants are currently nationally funded, (iii) several participants’ countries do not participate in the e-RARE2 European funding scheme for rare diseases. European leadership in reproductive research/medicine will be augmented by the Action’s anticipated benefits, (i) collaboration among previously competing groups, (ii) shared use of cutting-edge genetic methodologies, and (iii) recruitment/training of young investigators.

Keywords: GnRH deficiency, Kallmann syndrome, genetics, reproduction, translational research

Working Groups

WG1 Clinical Group
WG2 Genetics & Bioinformatics
WG3 Basic Research
WG4 Education and Training

Action BM1106

The Genes In Irritable Bowel Syndrome Research Network Europe (GENIEUR)

Objectives

The aim of this Action is the creation of a pan-European interdisciplinary network to identify genetic factors contributing to IBS etiopathogenesis. This will be facilitated by the creation of a phenotyping tool and the coining of endophenotypes (quantitative traits) for correlation analyses. The interdisciplinary connection of clinicians specialized in functional GI disorders, immunology and psychiatry and basic scientists focusing on (epi-) genetics, microbiomics and phenotypic analysis of case-control cohorts in the COST Action is an important prerequisite for success in this field.

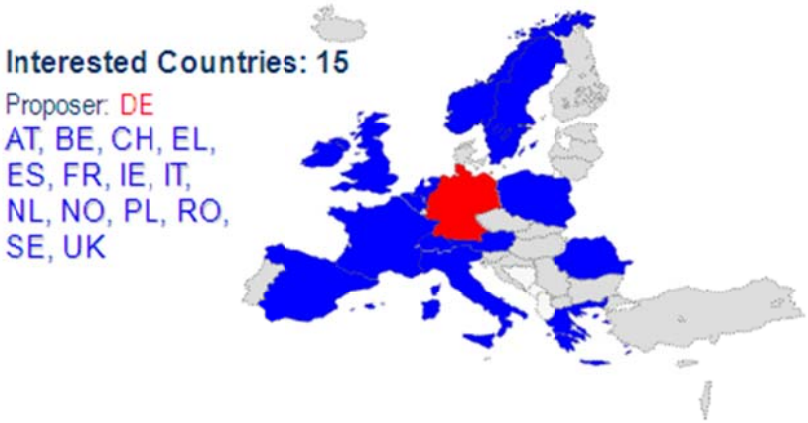
Abstract

Irritable bowel syndrome (IBS) is a highly prevalent functional gastrointestinal (GI) disorder with a major impact not only on the healthcare system but also on the patient's quality of life. (Epi-) genetic factors contributing to the pathogenesis of IBS have not further been specified and knowledge is still poor. The search for (epi-) genetic factors in IBS is hampered by the fact that only a few groups worldwide have just recently started to perform genetic analyses in small cohorts. Consequently, contradictory results have been reported due to low statistical power. This COST Action will foster the establishment of a pan-European, interdisciplinary network with the major goal being the creation of guidelines for patient / control recruitment as well as phenotypic characterization by defining quantitative traits as intermediate phenotypes for the following identification of genetic factors in the pathogenesis of IBS. This Action will represent a solid basis for novel diagnostic and therapeutic approaches and will significantly improve the insight into IBS pathophysiology, and, hence, help identify new targets for treatment with the ultimate goal of increasing quality of life of affected patients.

Keywords: irritable bowel syndrome (IBS), genetics/epigenetics, microbiome, phenotyping, biobanking

Working Groups

WG1	Establishment of gold standards for patient recruitment and characterisation
WG2	Definition of quantitative traits and intermediate phenotypes
WG3	Genetic Studies
WG4	Microbiomics
WG5	Database and Website implementation



TD1104

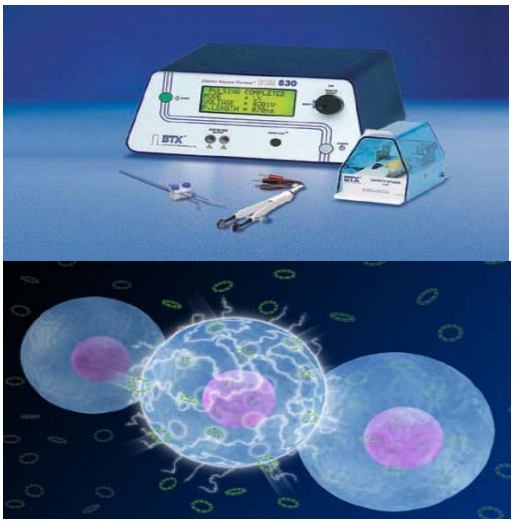
European network for development of electroporation-based technologies and treatments - EP4Bio2Med

Objectives

The main objective of the Action is to streamline European research on electroporation ranging from basic research to industrial and medical applications by collecting, pooling and transferring knowledge to partners. This will allow advancing basic knowledge of electroporation, to overcome current limitations of electroporation-based applications, and stimulate the development of new and advancements of existing electroporation applications.

Abstract

Exposure of biological cells to a sufficiently strong external electric field results in increased permeability of cell membranes, referred to as electroporation. Since all types of cells (animal, plant and microorganisms) can be effectively electroporated, without addition of viral or chemical compounds, electroporation is considered to be a universal method and a platform technology. Electroporation has become a widely used technology applicable to e.g. cancer treatment, gene transfection, food and biomass processing, and microbial inactivation. However, despite significant progress of electroporation-based applications, there is a lack of coordination and interdisciplinary exchange of knowledge between researchers from different scientific domains. Thus, critical mass for new major breakthroughs is missing. This COST Action aims to: (i) provide effective steps to increase the European scientific and technological cooperation required to foster basic understanding of electroporation, (ii) improve communication among European research groups to streamline research and development (R&D) activities, and (iii) integrate multidisciplinary research teams, as well as to provide comprehensive training for Early-Stage Researchers (ESRs) to foster development of new and existing electroporation-based applications. COST Action results will provide multiple societal, scientific, and technological benefits in the field of medicine, biotechnology and environment preservation.



Keywords: electroporation, cancer treatment, pulsed electric fields, microbial inactivation, food processing and preservation

Working Groups

WG1 Basic mechanisms of electroporation and modelling
WG2 Food processing and pharmaceuticals
WG3 Medical applications
WG4 Sustainable environmental applications and biomass processing
WG5 Technology development and transfer

Non-COST participation: Argentina, Australia, New Zealand, Russia, Ukraine, USA

Action FA1104

Sustainable production of high-quality cherries for the European market

Objectives

The main aim of the Action is to develop strategies to safeguard European cherry production by the adaptation of cherry cultivation to climate change, the implementation of cultivation practices aimed at promoting sustainable agriculture, and the promotion of high-quality fruits. As a multi-disciplinary network, special emphasis will be put on ensuring tight links between the different fields of knowledge. The specific objectives relate to: Genetic resources, breeding, genetics and genomics; Crop production; Crop protection; and Socioeconomics and dissemination.

Abstract

This Action aims at creating a dynamic network of scientists and other professionals conducting research to improve sweet or sour cherry production in Europe, the main cherry producer. Cherries are highly appreciated fruits for their taste and nutritional properties. Their production is economically important for many fruit growers in almost every European region but there is a need for coordinated research. Therefore, this network will address all research aspects related to cherry production, commercialisation, and consumption. It will be multidisciplinary and will involve scientists working in the fields of plant breeding, genetics, genomics, agronomy, physiology, phytopathology, entomology, microbiology, post-harvest technology, and socio-economics. A special emphasis will be placed on key EU priorities such as the promotion of sustainable agriculture and adaptation to climate change. Expected deliverables will be the exchange of data between research teams, the adoption of common experimental protocols, the implementation of predictive models in the fields of epidemiology and tree phenology, and the establishment of coordinated European marker-assisted selection strategies, including multi-location field trials. Beneficiaries will include not only breeders and producers but consumers as well, through the availability of better cherries.

Keywords: sweet and sour cherry, rootstocks, climate change, sustainable agriculture

Working Groups

WG1 Genetic resources and Breeding, Genetics and Genomics
WG2 Crop Production
WG3 Crop Protection
WG4 Socio-economics and dissemination

Non-COST participation: Australia, South Africa

Action FA1105

Towards a sustainable and productive EU organic greenhouse horticulture

Objectives

The main objective of the Action is to improve and disseminate knowledge for new and better production strategies, methods and technologies to support sustainable and productive organic greenhouse/protected horticulture in the EU.

Abstract

Organic greenhouse horticulture (OGH) (i.e. the production in greenhouses or polytunnels) in the EU should improve its sustainability, production and productivity. Emissions of nutrients and its footprint should be reduced. Production and productivity are too low to meet the demand of the society. The scientific challenges are to design sustainable irrigation and fertilization strategies, to reveal the mechanisms of resilience, robustness and suppressiveness for the management of pests and diseases, to integrate crop management, energy saving, renewable energy sources and new techniques and combinations with other activities and business to realize climate neutral production. This COST Action coordinates, strengthens and focuses the activities of the partners. It improves the communication, offers a common agenda, more and better knowledge for less money, sharing new techniques, an improved dissemination to OGH, basis for further collaboration in joint research proposals and support in the development of EU standards for OGH.

Keywords: Sustainable and productive EU organic greenhouse horticulture

Working Groups

WG1 Robust planting material
WG2 Soil fertility, suppressiveness and water management
WG3 Plant health
WG4 Energy saving and climate neutral production
WG5 Sustainability and standards

Non-COST participation: Canada

Action FA1106

An integrated systems approach to determine the developmental mechanisms controlling fleshy fruit quality in tomato and grapevine

Objectives

The main objective of the network is to address in an unprecedented way the mechanisms underlying fleshy fruit development and quality traits by harnessing European fruit research to the most advanced genomics and post-genomics technologies and by implementing integrated multidisciplinary approaches. The new insight on the physiology, biochemistry and genetics of fleshy fruit expected from the Action will provide new leads towards improving the sensory and nutritional qualities of both climacteric and non-climacteric fruit types. Moreover, the training of researchers, and particularly young scientists, on cutting-edge methodologies and the implementation of bioinformatics tools for data integration will significantly enhance the competitiveness of European research in this field.

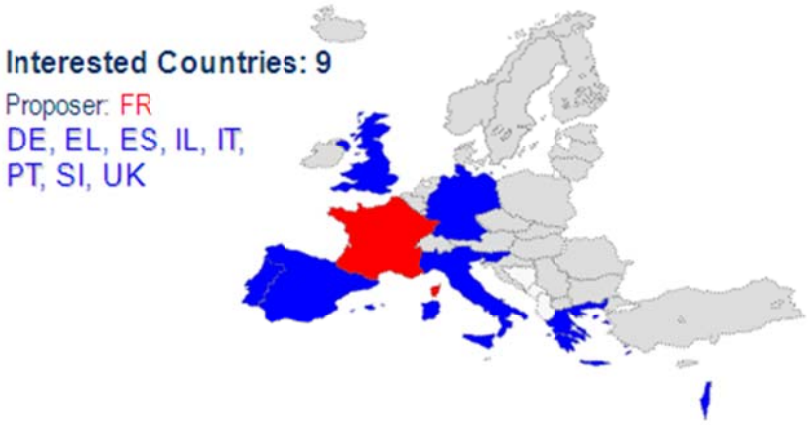
Abstract

Because it is now well admitted that daily consumption of fruit provides important health benefits, it becomes important to decipher the mechanisms by which nutritional and sensory qualities are established during fruit development. Building on the completion of the whole genome sequence for the two major fleshy fruit species tomato and grapevine, this COST Action aims to bring together research groups working on climacteric (tomato) and non-climacteric (grape) model fruits to exchange knowledge and to harness European research in this area to the most advanced genomics and post-genomics technologies. The Action will bring new insight on the physiology and biochemistry of fleshy fruit. The training of researchers on cutting-edge methodologies and the implementation of bioinformatics tools for data integration will significantly enhance the competitiveness of European research in this field. Combining studies on the two fruit models in an unprecedented multidisciplinary approach will expand our understanding of fruit development and will provide new leads to improve fruit quality.

Keywords: grape and tomato, fleshy fruit quality, genomic and post-genomic technologies, climacteric and non-climacteric ripening, developmental mechanisms

Working Groups

WG1 High-throughput facilities for tomato and grapevine
WG2 Bioinformatics tools for data analysis
WG3 Systems biology for fleshy fruits
WG4 Functional tools for reverse genetics and genetic mapping in tomato and in grapevine



Action TD1107

Biochar as option for sustainable resource management

Objectives

The aim of the Action is to expand and interconnect knowledge in Biochar systems, to assess environmental impacts of Biochar use and thus sharpen a promising global change mitigation tool up to the stage where economically feasible application will begin.

Abstract

This COST Action connects scattered European Biochar research to enable quick implementation of intelligent material flow management systems, to maintain or improve soil quality while efficiently sequestering carbon in the long-term. Innovative Biochar strategies can help the EU mitigating greenhouse gases, while industries and farmers benefit from new markets, opportunities and use of improved soils, e.g. for biofuel production without endangering food supply. However, a risk assessment is necessary to protect food web and human health. Current Biochar research is often fragmented, unnecessarily repeated, and new scientific evidence is not connected or implemented, due to the lack of interaction and knowledge exchange. Therefore, this Action aims at coordinating European Biochar research, bringing together researchers, stakeholders and potential users from EU and candidate countries. This will be accomplished by annual Biochar Workshops, Short-Term Missions among young, senior and female researchers, Training Schools, and an internet platform to monitor and streamline Biochar R&D. Four Working Groups will focus on (i) Biochar production and characterisation, (ii) land use implementation, (iii) economic analysis including life cycle assessment and (iv) environmental impact assessment. The Action will thus strengthen EU's leadership in the increasing competition with non-European Biochar actors.

Keywords: sustainable management of natural resources, climate change mitigation, carbon negative technology, soil amelioration, improved nutrient use efficiency

Working Groups

WG1 Biochar production and characterisation
WG2 Land use management
WG3 Economic analysis including life cycle assessment
WG4 Environmental impact assessment

Action FP1103

Fraxinus dieback in Europe: elaborating guidelines and strategies for sustainable management (FRAXBACK)

Objectives

The aim of the Action is, through sharing and synthesis of available knowledge generate comprehensive understanding of Fraxinus dieback phenomenon, and to elaborate state of the art practical guidelines for sustainable management of Fraxinus in Europe.

Abstract

Currently, severe dieback of *Fraxinus* spp. is observed in most European countries. This is an emerging disease, which results in massive tree mortality, threatening the existence of *Fraxinus* over the continent. It is caused by *Hymenoscyphus pseudoalbidus*, alien and invasive fungus, origin of which remains unknown. Currently, many European countries have national research programs on *Fraxinus* dieback, focusing on numerous aspects of the biology and ecology of the disease, but the activities are scattered. Aim of the FRAXBACK is, through sharing and synthesis of available knowledge, generate comprehensive understanding of *Fraxinus* dieback phenomenon, and to elaborate state of the art practical guidelines for sustainable management of *Fraxinus* in Europe. The Action will be implemented through innovative interdisciplinary approach, and will include forest pathologists, tree breeders and silviculturists. Its deliverables: i) guidelines for sustainable management of *Fraxinus* in Europe; ii) European database for dieback-resistant *Fraxinus* genotypes/families/populations and established/planned progeny trials; iii) illustrated digests/leaflets/brochures on *Fraxinus* dieback; iv) disease distribution maps; v) website; vi) book. FRAXBACK is comprised of four Working Groups: WG1 Pathogen; WG2 Host; WG3 Silviculture; WG4 Dissemination and knowledge gaps. Its duration is 4 years, including two MC/WG meetings and four STSMs per year, and one international conference.

2. Records of the dieback: 1995 - 2011

Keywords: Fraxinus dieback, Hymenoscyphus pseudoalbidus, alien invasive organisms, breeding for resistance, forest management

Working Groups

WG1 Pathogen
WG2 Host
WG3 Silviculture
WG4 Dissemination and knowledge gaps

Non-COST participation: China, New Zealand, Russia, Ukraine

Action FP1104

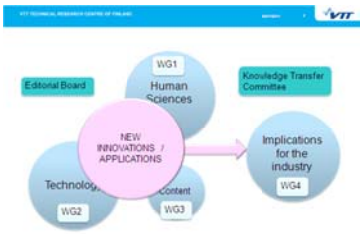
New possibilities for print media and packaging - combining print with digital

Objectives

The Action aims at supporting new innovations for the paper and printing industry by taking into account the customers and new technological possibilities. Thorough understanding of the customers, their needs and expectations lays an excellent foundation for new innovations and makes co-creation possible. The Action will strive for interactive fibre-based media and packaging products that utilize different combinations of print and digital.

Abstract

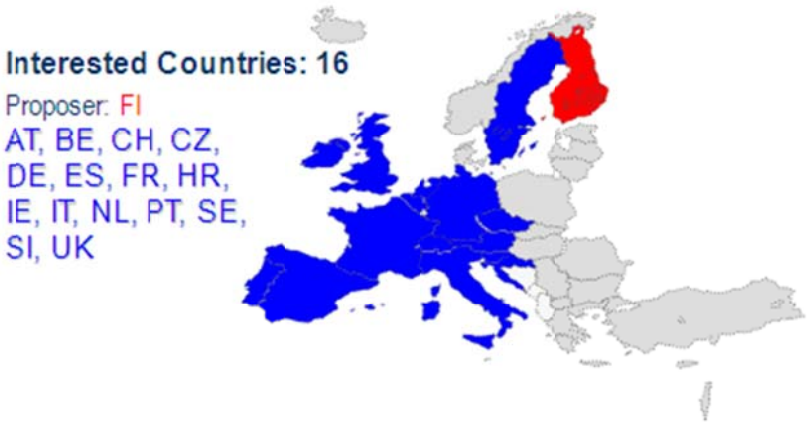
The goal of this Action is to promote discussion on the benefits that may be achieved from novel combinations of print and digital. It will also be used to enhance innovations that will make use of the benefits of both print and electronic media as well as innovations where print and electronic media are combined. Several examples exist where successful combinations have been achieved e.g. through the use of image recognition, augmented reality or printed electronics to bring interactivity into fiber based products. To give the forest industry a competitive edge this Action will focus on new innovations by combining knowledge of the end users with most recent technological achievements. New models of on-going change in social interaction and in the cultural products of paper and electronic media will be elaborated and proposed. The results will promote critical and theoretical discussion on the changing meanings of contemporary media culture. The Action will explore new business opportunities for the fiber based products and the value chains of print media and packaging through novel, innovative uses. It will also serve as a channel for communication between industry and academia, thus contributing to the development of new commercial applications.



Keywords: print media, packaging, digital media, social interaction, printed electronics

Working Groups

WG1 Customers and users
WG2 Technology
WG3 Content
WG4 Implications on the European paper and printing industry



Action FP1105

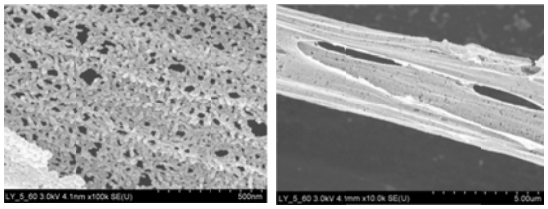
Understanding wood cell wall structure, biopolymer interaction and composition: implications for current products and new material innovation

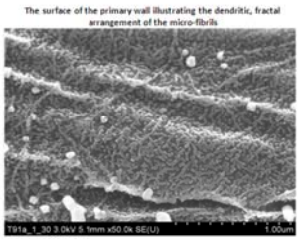
Objectives

The main objective of the Action is to increase understanding of the factors controlling wood cell structure, biopolymer interaction and composition by exploring and evaluating emerging theories and techniques in the fields of theoretical physics, analytical chemistry, plant physiology, plant genetics, biotechnology, materials science and mathematical modelling. The most important goal is to utilise this understanding to support the development of self assembly processes which could lead to new biopolymer based materials.

Abstract

The primary objective of the proposed Action is to build knowledge and understanding of fundamental physical (self assembly) processes and biological systems (e.g. genetic control) that drive natural structures and biopolymer composition within the plant/wood cell wall and to use new knowledge of self assembly processes to support the development of new biopolymer based materials.
The Action also aims to quantify the impact of new knowledge on our understanding of the mechanical properties of the cell wall and how processes such as pulping, bleaching recycling, cell wall disintegration methods and on-going tree improvement and biotechnology programmes impact both positively and negatively on structure and composition of the cell wall. The intent is to explore how this knowledge can be used to support on-going improvement in these areas of activity. An overarching goal is to develop multidisciplinary competence and capability to support these objectives and to work closely with commercial organisations to promote effective dissemination of knowledge and the development of a more economically sustainable Forest Based Sector.



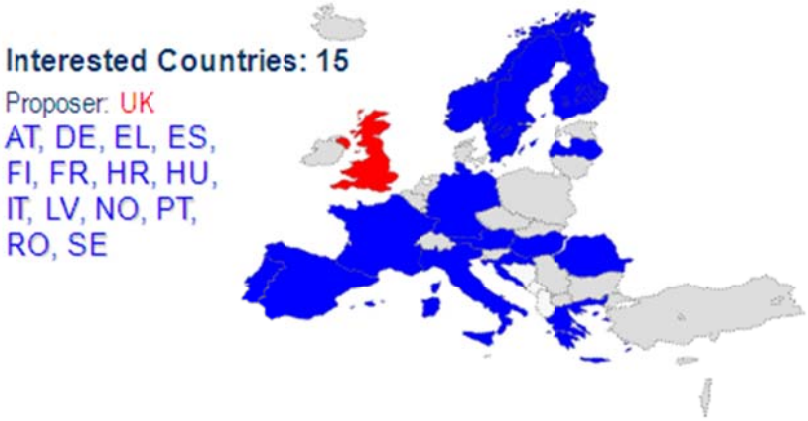


Keywords: Biopolymers, new materials, theoretical physics, self assembly, plant cell wall

Working Groups

WG1 Understanding cell wall structure, biopolymer composition and polymer interactions and their impact on cell wall properties
WG2 Fibre processing
WG3 Use knowledge of physical self assembly processes to develop new biopolymer based materials

Non-COST participation: Canada, China, New Zealand, USA



Action FP1106

STReESS - Studying Tree Responses to extreme Events: a SynthesiS

Objectives

STREeSS aims to improve the understanding of processes behind responses to extreme climate conditions in European trees and forests. This will be achieved by creating a platform for collecting, organising and synthesising results from research conducted in dendrochronology, wood anatomy, ecophysiology, forest genetics and forest ecology. The outcome will be an integration of knowledge on stress responses of trees and in-depth understanding of (1) mechanistic processes behind stress response in trees, (2) development of new concepts to come up with solutions for assessment of future climate-change impacts on trees, and (3) mitigation of stress responses by strengthening the scientific basis for a sound selection of tree species and specific provenances.

Abstract

Climate change and subsequent increase in frequency and intensity of extreme climatic events will affect vitality, production and wood quality of European trees.
STREeSS is based on the enormous potential of dendro-sciences (including Dendrochronology, Wood anatomy and Ecophysiology) to study effects of extreme events such as drought, heat waves, late frost and flooding on tree performance and wood formation. Within these disciplines impacts on tree growth are currently assessed in a range of field studies and experiments among European countries, in both field and laboratory conditions. Research focus differs from cell to landscape with a temporal scale from minutes to millennia and sites ranging from extreme hot and dry to cold and wet environments. At the current stage it is crucial to integrate knowledge conducted in the different disciplines to generate a basic understanding of short to long-term physiological responses of tree species and provenances to extreme climate conditions.
By linking scientific expertise and facilitate data exchange and organisation as well as harmonization of methodologies STREeSS will form a platform for pushing frontiers between the disciplines forward. This will strengthen the scientific basis for a sound species and provenance selection as well as for a sustainable management of European forests.

Keywords: Extreme climate events, Trees, Wood anatomy and quality, Ecophysiological modelling

Working Groups

WG1 Inventory & organisation of data
WG2 Tree-model based integration and interpretation
WG3 Priorities and Needs

Non-COST participation: Australia

Action CM1104

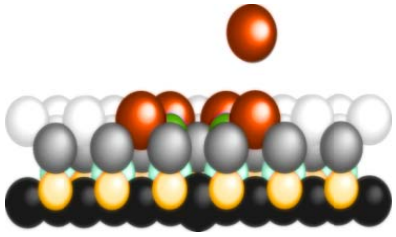
Reducible oxide chemistry, structure and functions

Objectives

The aim of the Action is advancing reducible oxide research in route from fundamentals to complex oxide systems ready for industrial application. The main outcome will be a step change in the understanding of reducible oxide systems required for exploiting the interplay between structure, electronic and ionic processes and reactivity in reducible oxides and controlling new oxide functionalities. The Action gathers a large number of well-trained scientists with a high innovative power to tie the European research community in this field closely together and to develop strong links to application partners. Furthermore, the Action provides encouragement and strong support for students and early-stage researchers, which is crucial for sustainable human resource development. Beside the research output published in scientific journals, deliverables are a coherently acting research infrastructure, transfer of the generated knowledge to stakeholders and end users, workshops and training schools for students and the education of a new generation of highly qualified researchers networked into a wider context of European research exploiting reducible oxides.

Abstract

Reducible metal oxides are most versatile solid state compounds exhibiting a rich chemistry related to changes of the metal oxidation state. As complex materials like porous networks, nanocrystals and functionalised surfaces, they play a paramount role in (photo)catalysis, microelectronics, energy conversion and storage, sensor and fuel cell technologies. The Action unites objective driven experimental and theoretical research devoted to (1) exploring the origins and details of reducibility in oxides, (2) creating novel routes for the growth and synthesis of nanostructured reducible oxide systems, (3) exploiting and tailoring reducibility in oxide systems to yield specific functionalities and (4) exploring novel applications and visionary concepts for the future use of reducible oxide materials. The gained fundamental understanding opens up new ways to explore, control, and tailor chemical reactivity, thus facilitating rational design of novel oxide structures with unique properties. This allows establishing trend-setting technologies and fosters advances by related European industries. European experts coordinating their highly innovative joint research on reducible oxides via this Action will address important future societal and economic issues like efficient and green synthesis of chemicals and environmentally friendly energy conversion.



Keywords: reducible oxides, experiment and theory, growth and analysis, controlling reactivity, applications in (photo)catalysis - energy conversion - microelectronics

Working Groups

WG1 Origins of reducibility
WG2 Preparing reducible oxide systems
WG3 Controlling reducibility
WG4 Reducible oxide visions

Action CM1105

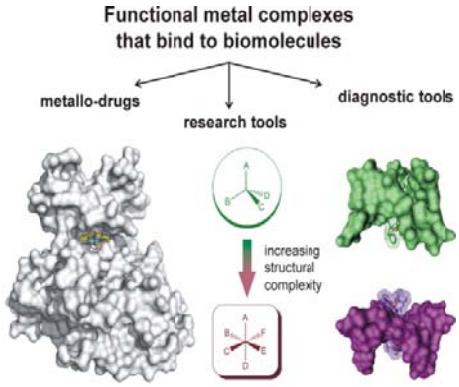
Functional metal complexes that bind to biomolecules

Objectives

The aim of the Action is to develop and evaluate in a structure-targeted approach new metal-based compounds that exert their function as metallo-drugs, as research tools, or as diagnostic tools by binding to biomolecules, and to understand their modes of action.

Abstract

This Action will focus on the development of novel metallo-drugs in a structure-targeted approach. By targeting specific protein clefts, RNA, and less common but functional DNA structures, biomolecular recognition processes involving metal complexes will be exploited in the design of innovative metallo-drugs. A particular focus will be given to structural details of the molecular interaction between the metal complexes and their biomolecular targets. In addition, the process of targeting and delivery, the interactions of the metallo-drugs on the cellular level, and prodrugs with novel activation strategies that get activated only at their target site will be investigated. The metal complexes include bioorganometallic compounds, rigid polynuclear complexes of defined shape, and other coordination compounds. Drugs based on metal complexes offer an extremely diverse structural chemistry and are excellent candidates to explore new three-dimensional space when targeting biomacromolecules. The ultimate aim will be the development of new therapies for cancer, infectious, and virus-related diseases. An additional benefit will be the design of metal complexes as tools for diagnostics and in fundamental research.

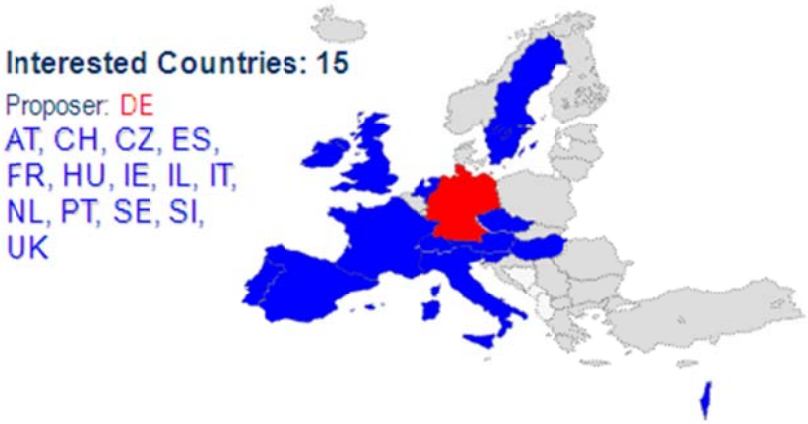


Keywords: medicinal inorganic chemistry, structure-targeted biomolecular recognition, metal-based drugs

Working Groups

WG1 Protein targets
WG2 Emerging nucleic acid targets (beyond the double helix)
WG3 Metal bioconjugates for targeting and delivery
WG4 Interactions of metallo-drugs on the cellular level
WG5 Prodrugs with novel activation strategies

Non-COST participation: Australia, New Zealand



Action CM1106

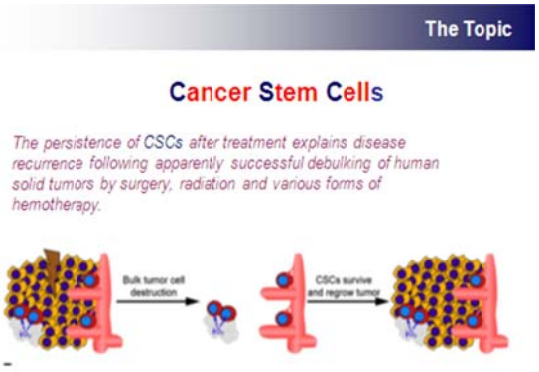
Chemical Approaches to Targeting Drug Resistance in Cancer Stem Cells

Objectives

The aim of the Action is to unite researchers with expertise in rational drug design and medicinal chemistry of synthetic and natural compounds with biomedical investigators dedicated to the understanding the mechanisms governing drug resistance in cancer stem cells.

Abstract

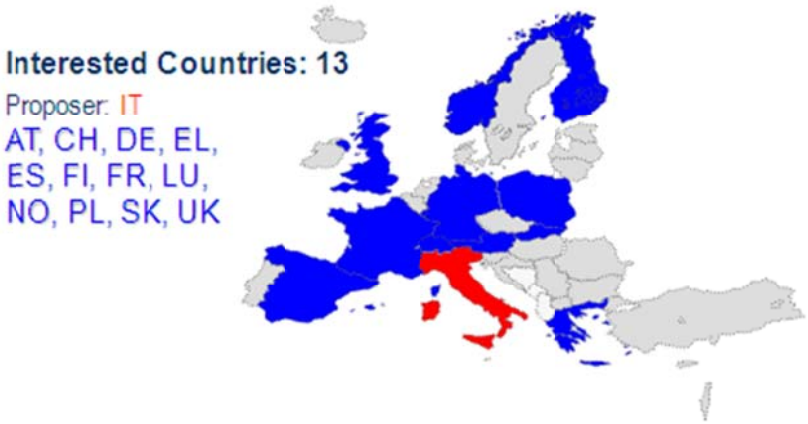
This COST Action aims to unite researchers with expertise in rational drug design and medicinal chemistry of synthetic and natural compounds with biomedical investigators dedicated to the understanding the mechanisms governing drug resistance in cancer stem cells. *Cancer stem cells* (CSC) are a subpopulation of cells within tumors that exhibit enhanced tumor-initiating attributes and are a major contributing factor to current cancer therapy failure. The CSC phenotypic state comprises distinct molecular and functional differences that underpin resistance to current treatments and the unique ability spread and to seed new tumors throughout the body. This insight necessitates an entirely new approach to cancer drug development to effectively target tumor CSCs. Through exchange of information, experience and expertise, researcher mobility and fostering new collaboration between chemistry and biology groups, the Action endeavours to develop new, effective methods for identifying novel compounds and drug candidates that target drug-resistant cancer stem cells.



Keywords: Cancer Stem Cells - Drug Resistance - Organic Synthesis - Drug Design

Working Groups

WG1 Biology and Pharmacology
WG2 Computational methods and Predictions
WG3 Synthesis, Medicinal Chemistry, Purification



Action ES1104

Arid Lands Restoration and Combat of Desertification: Setting Up a Drylands and Desert Restoration Hub

Objectives

The main objective of this action is to provide the science and practical guidance on the particular issue of arid lands restoration and combat of desertification through the establishment and management of vegetation. To this end, an Arid Lands Restoration Hub, which will assemble a multidisciplinary network of European and world experts, will be created. This endeavor, which has a unique remit, will identify current state of the art methods of restoration as well as tried and tested indigenous and traditional knowledge and methods from around the world. It will establish new research determining original and innovative restoration and planting methods and techniques, relative to local conditions and provide an open body of information that is not currently and readily available. The Action also aims at addressing all the impacts of Arid Land Restoration on ecosystems, on eco-hydrology and on the cycles of matter proactively. These impacts will be investigated a priori making arid lands restoration an instrument for the management of water, nutrient and carbon cycles.

Abstract

There is great need to restore existing despoiled drylands and to combat increasing desertification. Restoring habitats improves biodiversity, increases carbon sequestration, enhancing the quality of life for people. An essential measure is the planting of and reestablishment of vegetation. The successful establishment of vegetation in arid areas is complex requiring the multi-disciplinary skills of arid land experts with various capabilities (soils, hydrology, ecology etc.) However, vegetation restoration techniques in arid areas require review and development. This Action is required as access to information is acutely limited, disjointed and new techniques are available and not universally tested. This Action aims to create an 'Arid Lands Restoration Hub' to provide the science and practical guidance for dryland restoration and combat of desertification through a dynamic and productive international network of initially 29 participants from 15 COST countries and 2 partners from outside Europe. The Action will deliver an integrated database within a harmonized information hub of current and new methods and techniques of restoration, trials and field studies, assessment indicators, academic and practical publications, and tools to identify and support practical restoration projects and decision makers in planning and restoring drylands and the combat of desertification. The Action promotes open knowledge, innovation in procedures and methods for improved restoration in dry lands.

Keywords: Arid lands restoration, combat of desertification through planting, restoration techniques, arid lands restoration hub, dryland vegetation establishment

Working Groups

WG1 Focus Understanding Land Degradation and Causality - The Bigger Picture Think-Tank
WG2 Focus on Global Restoration and Combat of Desertification Techniques – Soils and Hydrology and Microclimate Manipulation for Enhanced Vegetation Establishment Think-Tank
WG3 Traditional and Innovative Systems: Plants, Ecology and Microclimate Manipulation for Enhanced Vegetation Establishment Think-Tank
WG4 Focus on Land Management - Creating and Designing Think-Tank
WG5 Knowledge Transfer, Outreach and Training

Non-COST participation: Namibia, South Africa

Action ES1105

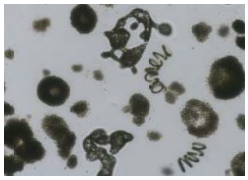
Cyanobacterial blooms and toxins in water resources: Occurrence, impacts and management

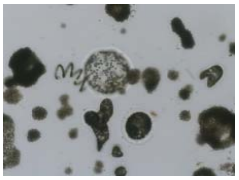
Objectives

The main objective of the Action is to increase, disseminate and harmonize capabilities across Europe for the risk management of cyanobacteria and cyanotoxins in water bodies, by establishing strong and synergistic links between academia, authorities, industry and citizens. The Action will compile and integrate experiences, identify research needs and gaps, focus on solutions and disseminate data, results and best management practices to end-users and stakeholders to protect public health, utilities, facilities and enterprises and hence contribute to European science, society and economy.

Abstract

Toxigenic cyanobacteria are one of the main health risks associated with European water resources. They produce a wide range of potent toxins with adverse health effects on humans and animals exposed to them via drinking water, aquaculture and recreation. European research in the field has generated significant risk management capability, although this is regionally unbalanced. This COST Action aims to transfer this knowledge and know-how to all European regions: widening awareness, spreading relevant technical competence, and sharing risk management expertise. The Action aims to provide tools to end-users (public authorities, water utilities, aquaculture, tourism and recreation sectors) by pooling and coordinating expertise throughout Europe and to harmonize methods and practices across Europe, thereby protecting public health, enterprises and investments. This arrival of this Action is timely because new challenges in the field have appeared recently including emerging toxins and cyanobacterial species hitherto unknown in Europe, leading to the preparation of new legislation and regulations in some European countries. Over 40 partners (scientists, other professionals and companies), from 23 European countries, are expected to participate in this Action. The coordination – networking tools provided by COST are the most suitable medium to achieve the Action's goals.



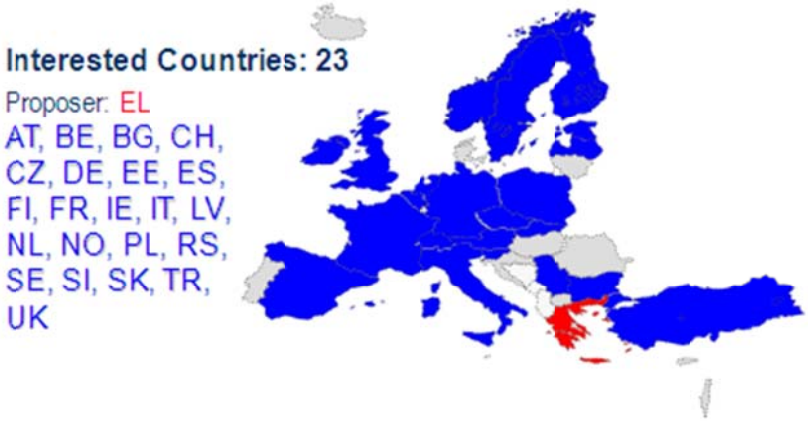


Keywords: cyanobacteria, cyanotoxins, public health protection, risk management, awareness

Working Groups

WG1 Occurrence and impacts of cyanobacteria and cyanotoxins
WG2 Fate, impact and health effects
WG3 Prevention and control measures
WG4 End-user and outreach tools, materials and products

Non-COST participation: USA



Action ES1106

Assessment of EUROpean AGRIculture WATer use and trade under climate change (EURO-AGRIWAT)

Objectives

The main objective of the Action is twofold. On the one hand, the Action will deliver improved methodologies and databases for the European wide assessment of water footprints of agricultural systems at different spatial scales (local case study areas, watershed, country) associated to key food and energy crops and the virtual water trade associated to the import/export of such agricultural products. On the other hand, the Action will also deliver an updated assessment of water footprint and virtual water trade under climatic conditions, including their uncertainties, as well as scenarios concerning WF and VWT under future climatic conditions or under different agricultural practices. In this sense, an important component of the Action will be the preparation and dissemination of recommendations and guidelines for enabling a more efficient water resource management in relation with agricultural activities under climate change and variability. To guarantee the international dissemination of the Action activity and outcome, liaison is established with the World AgroMeteorological Information Service (WAMIS), managed by the WMO.

Abstract

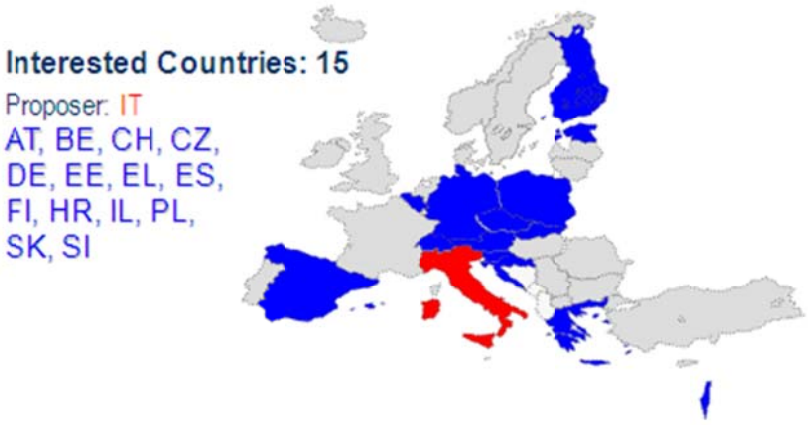
The COST Action EURO-AGRIWAT will focus on the assessment of water footprint (WF) and virtual water trade (VWT) of key food and no-food agricultural products, including their uncertainties, as well as scenarios concerning WF and VWT under future climatic conditions. The use of advanced tools and data such as remote sensing, updated climatic databases, climatic projections/scenarios and agrometeorological models represents the base of the activity. The use of such instruments will allow a detailed analysis of interactions between crops, climate and management that will be taken into account in the WF assessment. An important component of the Action will be the preparation and dissemination of recommendations and guidelines for enabling a more efficient water resource management in relation with agricultural activities under climate change and variability. The framework of a COST Action represents the most suitable way for facing the outstanding and multi-faceted problem of sustainable water use, being characterized by a non-competitive and interdisciplinary environment of high scientific level. These features will allow collaboration between scientists and stakeholders and the development of common strategies to broaden the available research expertise.

Keywords: Climate change, agricultural water management, virtual water, water footprint, agrometeorological methods and models

Working Groups

WG1 Water footprint
WG2 Water trade
WG3 Sustainability

Non-COST participation: Australia, South Africa, USA, International body World Meteorological Organization – Commission for Agricultural Meteorology



Action TD1105

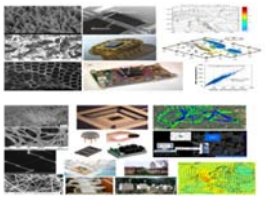
European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability - EuNetAir

Objectives

The aim of the Action is to form a European-wide science and technology knowledge platform by a multidisciplinary coordinated network at international level on the new sensing technologies for Air Quality Control including sensor nanomaterials, portable wireless sensor-systems and distributed computing, air-quality modelling and chemical weather forecasting, standards, methods and protocols for environmental measurements in order to advance R&D and innovation in the European green-economy by strengthening the sustainable development in smart cities, outdoor air-pollution control and indoor energy efficiency in buildings and to foster the technology transfer of the new sensing paradigm of the cost-effective chemical sensors in the European countries with a special focus on SMEs.

Abstract

This Action will focus on a new detection paradigm based on sensing technologies at low cost for Air Quality Control (AQC) and set up an interdisciplinary top-level coordinated network to define innovative approaches in sensor nanomaterials, gas sensors and devices, wireless sensor-systems, distributed computing, methods, models, standards and protocols for environmental sustainability within the European Research Area (ERA). The state-of-the-art research on innovative sensing technologies for AQC based on advanced chemical sensors and sensor-systems at low-cost, including functional materials and nanotechnologies for eco-sustainability applications, the outdoor/indoor environment control, olfactometry, air-quality modelling, chemical weather forecasting, and related standardisation methods is performed already at the international level, but still needs serious coordination efforts to boost new sensing paradigms for research and innovation. Only a close multidisciplinary cooperation will ensure cleaner air in Europe as well as reduced negative effects on human health for future generations in smart cities, efficient management of green buildings at low CO2 emissions, and sustainable economic development. The objective of the Action is to create a cooperative network to explore new sensing technologies for low-cost air-pollution control through field studies and laboratory experiments, to transfer the results into preventive real-time control practices and to move towards global sustainability via monitoring climate change and outdoor/indoor energy efficiency. Establishment of such a network, involving COST country participants as well as non-COST key-experts, will enable Europe to develop world capabilities in urban sensor technology based on cost-effective nanomaterials, to form a critical mass of researchers suitable for cooperation in science and technology, to give training and education, to coordinate outstanding R&D, to promote innovation towards industry, and to support policy-makers.

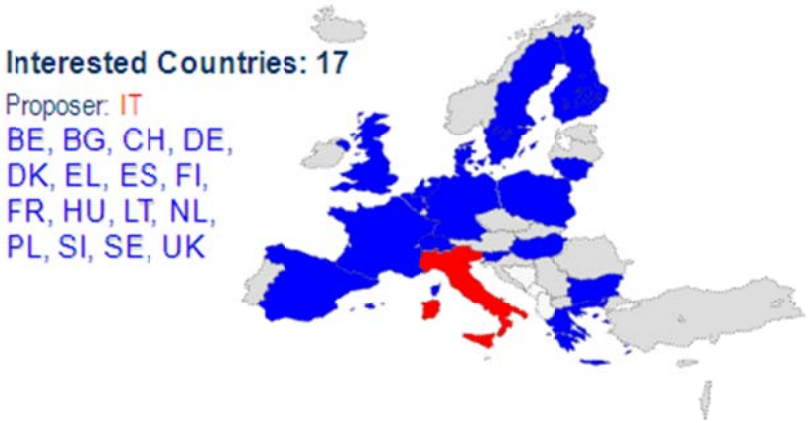


Keywords: sensor functional materials, nanomaterials and sensing nanostructures, gas sensors and wireless sensor-systems with distributed computing, air quality control/monitoring and environmental measurements/modelling, protocols and standardisation methods for environmental sustainability and chemical weather forecasting

Working Groups

WG1 Sensor materials and nanotechnology
WG2 Sensors, devices and systems for AQC
WG3 Environmental measurements and air-pollution modelling
WG4 Protocols and standardisation methods

Non-COST participation: Australia, Canada, China, Russia, USA



Action MP1105

Sustainable flame retardancy for textiles and related materials based on nanoparticles substituting conventional chemicals (FLARETEX)

Objectives

The aim of the Action is to form a European multidisciplinary Knowledge Platform on Sustainable Flame Retardancy to facilitate the rapid development of fire safe textiles and related materials of low toxicity and ecotoxicity, using all the available technologies. In particular, this platform will help to promote cooperation between researchers from different scientific disciplines, efficiently exchanging ideas and strategies in order to lead developments in fire safety, fire retardants and environmentally friendly fire retarded textiles and related materials.

Abstract

Replacement of existing flame retardants (FR) with sustainable and environmentally friendly alternatives for textiles in domestic, safety, transport (automotive, rail, aerospace and marine), civil emergency and military, construction and other industries requires a multidisciplinary approach from textile technology to the physics and chemistry of fire. This COST Action will create an international multidisciplinary scientific and technology network on Sustainable Flame Retardancy, developing new innovative flame retardants with low fire toxicity and environmental impacts and halogen-free. A COST Action is ideal to promote the existing cooperation in flame retardancy research, in order to accelerate growth to keep Europe leading the world in this crucial area, taking into account sustainability, safety and health, and to facilitate its commercial exploitation in Europe. It will stimulate European cooperation and technology transfer to industry with valuable input from (inter)nationally funded research via Working Group meetings, workshops, conferences, Training Schools and Short-Term Scientific Missions (STSM) for early stage researchers (ESR), etc.

Keywords: Non-toxic flame retardants (FR), environmental impact and Life Cycle Analysis (LCA), sustainable FR systems, textile (related) materials, halogen-free flame retardants

Working Groups

WG1 Novel Flame Retardants
WG2 Toxicological/environmental aspects
WG3 Processing/Applications/Commercialisation
WG4 Testing/Standardisation

Action MP1106

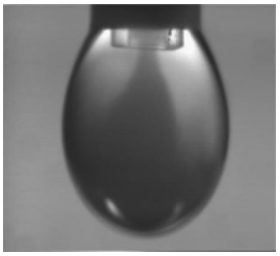
Smart and green interfaces - from single bubbles and drops to industrial, environmental and biomedical applications

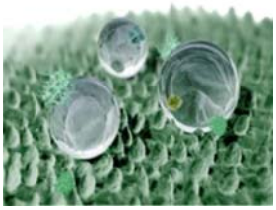
Objectives

The aim of the Action is to organize a Europe-wide interdisciplinary cooperation platform directed towards scientific added value and improvement of industrial, environmental and medical applications concerning interfaces, bubbles and drops.

Abstract

Bubbles and drops are entities of enormous practical interest since their interfaces are met in numerous industrial processes and applications of every day life. In order to enhance efficiency, the creation of revolutionary Smart interfaces is demanded: interfaces that are easily manipulated with well-controlled size and properties. The acute modern environmental problems require attributing eco-friendly features to Smart interfaces by incorporating innovative materials or processes. The outcome is Smart and Green (S&G) interfaces. The objective of this Action is to organize a network of groups from academia and industry in order to identify best strategies and means to produce S&G interfaces. Furthermore, state-of-the-art experimental, theoretical and numerical work will be combined to acquire insight into the underlying phenomena *through the scales* and *across the disciplines* for the implementation of S&G interfaces in industrial, environmental and biomedical applications. The Action's main deliverables are the networking between groups working on different aspects of S&G interfaces through organization of scientific events, training schools and STSMs, and the industrial interface to market new technologies. The professional perspectives of ESRs will be boosted through an extensive mobility program. The Action's main benefit is the endorsement of the European scientific and industrial leadership in this field.





Keywords: interfaces, bubbles, drops, surface agents, wetting

Working Groups

WG1 Fundamentals
WG2 Materials
WG3 Diagnostics
WG4 Technology

Non-COST participation: Australia, Canada, USA

Action IS1104

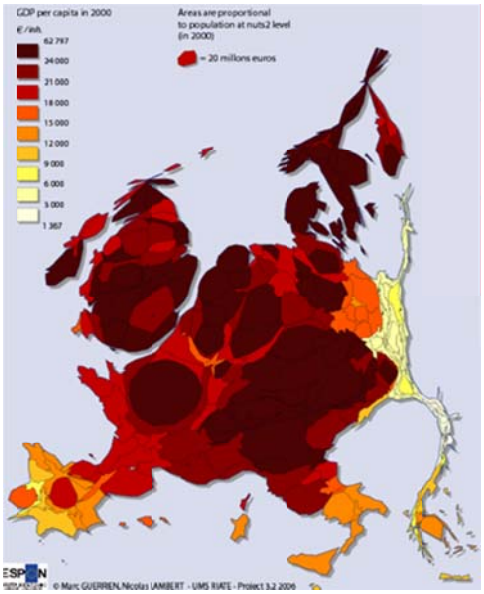
The EU in the new complex geography of economic systems: models, tools and policy evaluation

Objectives

The aim of the Action is to provide a better understanding of the EU as a complex, multi-level, evolving geographical system, taking duly into account the dynamic processes occurring within such a system and to develop improved strategies for EU regional policies.

Abstract

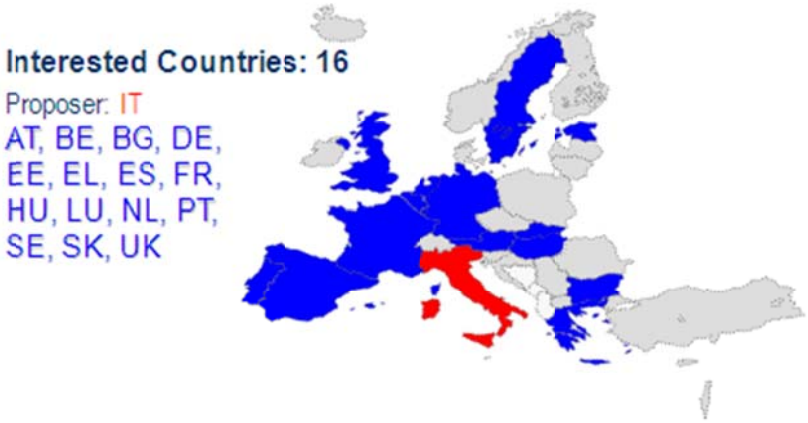
The uneven geographical distribution of economic activities is a huge worldwide challenge. For the European Union (EU) regions this is shown by the deep differences within and across nations. Spatial inequalities are evolving through time following complex patterns determined by economic, geographical, institutional and social factors. The New Economic Geography approach, which was initiated by P. Krugman in the early 1990's, describes economic systems as very simplified spatial structures. The Action aims at developing a more sophisticated modelling of the EU visualised as an evolving trade network with a specific topology determined by the number and strength of national, regional and local links. Economic policies should be specifically designed to take into account this pervasive network structure assessing the position of backward locations within the network and focussing on instruments that favour interconnections. The expected results will provide a basis for an improved evaluation of such policies, in particular for the European Cohesion policy, considering their impact on the welfare level of EU citizens and its geographical distribution. To achieve this objective this Action will enhance interdisciplinary networking combining recent approaches in economics with the most advanced mathematical and computational methods for analysing complex and non-linear systems.



Keywords: Geographical Economics, European Regional Policy, Complexity, Network Analysis, Nonlinear Dynamics

Working Groups

WG1 Economic geography modelling
WG2 The assessment of the role of institutions and markets
WG3 A detailed study of social and industrial interactions
WG4 Development of mathematical and computational methods and tools



Action IS1105

NETwork of experts on the legal aspects of MARitime SAFEty and security (MARSAFENET)

Objectives

The aim of the Action is to develop a far-reaching advancement in legal research, which will promote a better understanding and an improvement of the complex legal framework on maritime safety and security. In detail, the Action intends to establish a network of researchers in the field, in contact with all interested actors, to share knowledge, integrate research and policy-making, develop relevant interdisciplinary skills and promote the involvement of early-stage researchers in the above mentioned thematic area.

Abstract

Maritime safety and security have become a matter of concern for many States and for the international community as a whole. However, the existing international legal framework does not yet recognize maritime safety and security as specific and autonomous legal regimes, and the practice also mirrors the weakness and the fragmentation existing in the field. This Cost Action will take an in-depth look at urgent current maritime questions, focusing on four main issues: i.e., shipping and marine environmental protection, new developments in economic activities at sea, international maritime security and border surveillance and, finally, the protection of fragile and semi-enclosed seas. The Action aims to bring together experts on the international law of the sea in order to increase knowledge on these topics and to develop a common conceptual and methodological framework with the goal of contributing to filling the above-mentioned gaps and of transforming scientific results into feasible solutions for ensuring safety and security at sea. The Action is intended to foster the identification and exploitation of synergies between EU policies on maritime safety and security. From this point of view, the Action is complementary to the existing European cross-sectorial initiatives in this area, and acquires added value from its implementation within the COST framework and through its permitting existing knowledge to be shared and enhanced within a structured comparative framework, with a view to a) disseminating findings at national and international level; b) identifying inputs for supporting the decision-making process in the field.

Keywords: Maritime safety and security, high seas freedoms, EU integrated maritime policy, ecosystem-based management approach, shipping, surveillance of maritime borders, renewable marine energies, maritime spatial planning, semi-enclosed and fragile seas, inter/cross sectorial perspective

Working Groups

WG1 Shipping and marine environmental protection
WG2 New developments of economic activities at sea
WG3 Maritime international security and border surveillance
WG4 Protection of fragile and semi-enclosed seas

Non-COST participation: Intergovernmental organizations IUCN, EU-EP

Action IS1106

Offender Supervision in Europe

Objectives

The main objective of the Action is to exchange, increase and deepen knowledge about offender supervision in Europe, in order to better understand its evolution and development in social context; how it is experienced by those subject to it; how it is constituted and constructed by those that practice it; and what its impacts and consequences are for all of those affected by it.

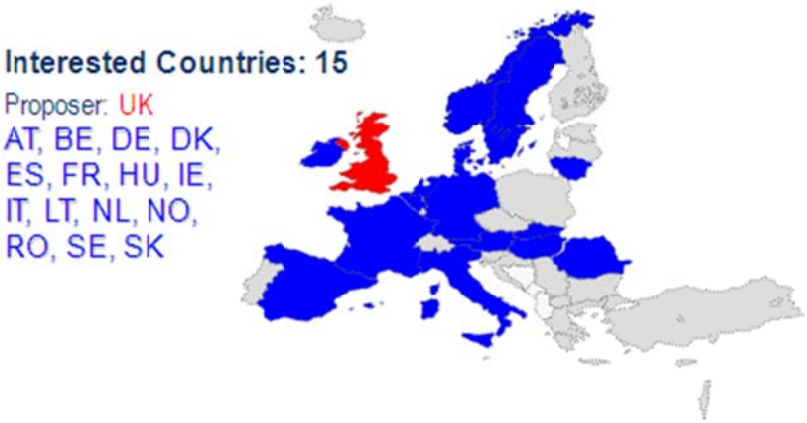
Abstract

Offender supervision in Europe has developed rapidly in scale, distribution and intensity in recent years. However, the emergence of 'mass supervision' (i.e. in the community) has largely escaped the attention of legal scholars and social scientists more concerned with the 'mass incarceration' reflected in prison growth. As well as representing an important analytical lacuna for penology in general and comparative criminal justice in particular, the neglect of supervision means that research has not delivered the knowledge that is urgently required to engage with political, policy and practice communities grappling with delivering justice efficiently and effectively in fiscally straitened times, and with the challenges of communicating the meaning, legitimacy and utility of supervision to an insecure public. This Action aims to remedy these problems by facilitating cooperation between institutions and individuals in different European states (and with different disciplinary perspectives) who are already carrying out research on offender supervision or, in the case of early stage researchers, are attracted to that field. It will review and synthesize existing knowledge and then enrich it through interdisciplinary and comparative work and capacity building. The Action will thus provide a European forum on offender supervision for academics, policy makers, practitioners and interested citizens.

Keywords: Offender supervision, probation, parole, community sanctions and measures, comparative criminal justice

Working Groups

WG1 Experiencing OS
WG2 Practising OS
WG3 Contextualizing OS



Action IS1107

European Network for Conflict Research (ENCoRe)

Objectives

The aim of the Action is to coordinate and accelerate the construction and maintenance of conflict datasets with the help of an integrated online portal that allows researchers and policy makers to analyse and forecast the outbreak and course of political violence around the world.

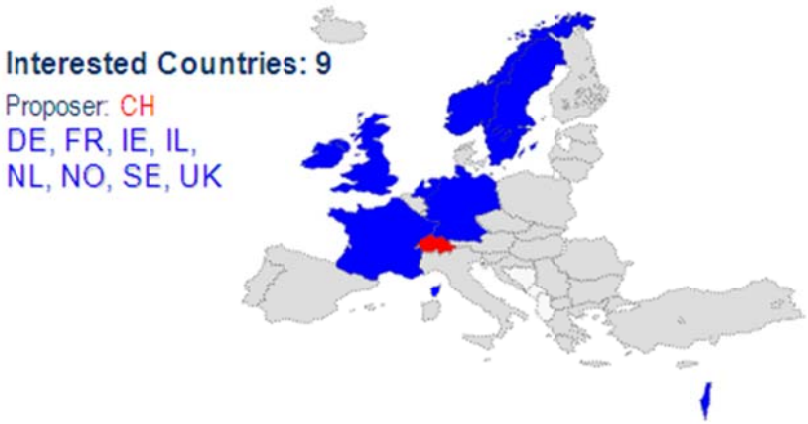
Abstract

The upheavals in North Africa and the Middle East in early 2011 caught most analysts and decision makers by surprise. In order to better prepare researchers and policy makers for future conflicts, this COST Action will build a new network called the European Network of Conflict Research (ENCoRe). Bringing together scholars in at least 10 COST countries, the network is supported by innovative tools for data integration and analysis. The aim of the Action is to coordinate and accelerate the construction and maintenance of conflict datasets with the help of an integrated online portal that allows researchers and policy makers to analyse and predict the outbreak and course of conflict processes around the world. Focusing on civil war and related types of political violence such as violent protest, riots, state repression and terrorism, our goal is to overcome institutional fragmentation currently hindering progress in European conflict research and to complement country-based analyses of countries with integrated data that enable scholars to study a wide range of risk factors. To achieve these objectives, the Action will launch a series of activities organized around the database system, as well as workshops with scientists and policy makers and training sessions for younger researchers.

Keywords: conflict research, risk analysis, political violence, relational data bases, geographic information systems

Working Groups

WG1 Dataset coordination
WG2 Database development
WG3 Analysis and Forecasting



Action IC1104

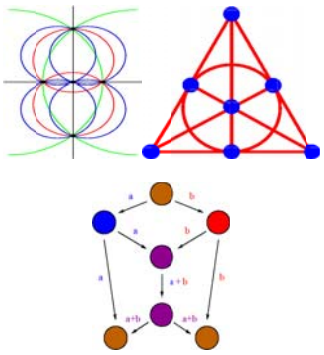
Random Network Coding and Designs over GF(q)

Objectives

The main objective of this Action is to advance European research in the field of network coding and designs over GF(q) towards a development and implementation of network codes of high quality, by cross-linking a number of European expert groups from several distinct disciplines and areas in information and communication technology. As a possible deliverable, this COST Action will foster the adoption of improved network codes as well as encoding and decoding algorithms in large networks. This will allow researchers worldwide to validate results against European standards set up by the participants of this Action.

Abstract

Random network coding emerged through an award-winning paper by R. Koetter and F. Kschischang in 2008 and has since then opened a major research area in communication technology with widespread applications for communication networks like the internet, wireless communication systems, and cloud computing. It allows transmitting information through a network by disregarding any of its topological features. As in traditional algebraic coding theory, two main research directions in random network coding are 1) existence and construction of good and optimal network codes, 2) efficient encoding and decoding schemes for a given network code. Restriction to the so-called Grassmannian codes has proven to be advantageous and leads to the theory of designs over GF(q). Worldwide, there exists a larger number of workgroups focusing on this topic, which includes several groups located in Europe. This COST Action will set up a European research network and establish network coding as a European core area in communication technology. Its aim is to bring together experts from pure and applied mathematics, computer science, and electrical engineering, who are working in the areas of discrete mathematics, coding theory, information theory, and related fields.



Keywords: Random Network Coding, q-ary Designs, Optimal Code Construction, Decoding Algorithm, Large (Wireless) Networks and Cloud Computing

Working Groups

WG1 Bounds on the size of network codes
WG2 Development of encoding and decoding schemes
WG3 Cryptographic aspects
WG4 Construction of network codes and Grassmannian codes
WG5 Foundational aspects

Action IC1105

3D-ConTourNet - 3D Content Creation, Coding and Transmission over Future Media Networks

Objectives

The main objective of the Action is to create a cooperation network among European researchers and industry experts in the field of 3D multimedia networked services and applications with the objective of increasing the added value of S&T in scattered R&D projects, for the benefit of academia, industry and ultimately the users of future 3D media technology, jointly integrating 3D content creation and encoding, 3D network-aware applications in ubiquitous network architectures and 3D end-user devices, to reach high levels of user acceptance and quality of experience.

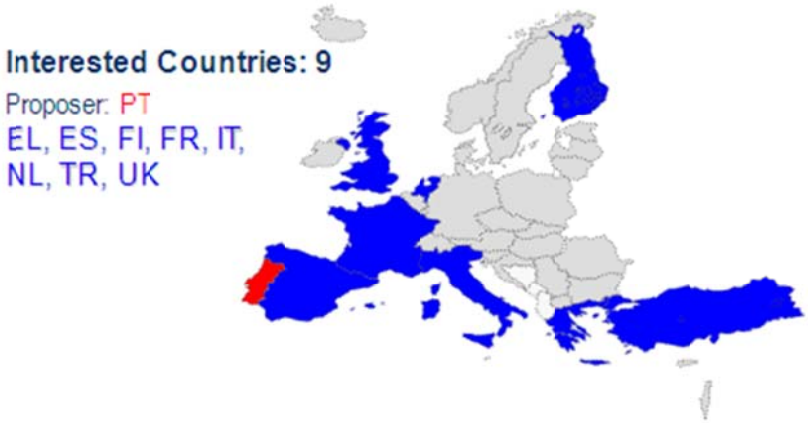
Abstract

This COST Action undertakes coordinated research collaboration, at European level, in 3D multimedia creation, encoding, delivery and reception of services and applications over future networking technologies. A scientific framework is devised to integrate the main elements of the delivery chain, such as 3D content creation and encoding evolution, transmission across heterogeneous networks and user consumption, taking perceived quality as an overall key performance factor. Several individual R&D efforts are currently running across Europe, targeted at 3D technologies. This Action aims at beyond this trend by tightening closer together scattered efforts and integrating all technological elements with user 3D quality perception. To reach this goal, this Action fuels cooperation between researchers and industry experts, envisaging production of technical and scientific deliverables for researchers, scientists, engineers and managers, new business model recommendations for content and service providers through joint meetings across academia and industry, plus documentation and multimedia presentations to promote 3D technology in the society. The benefits include increased relevancy of European research, contribution to the development and sustainability of new and better 3D multimedia communications technology and provision of a platform for faster launching and adoption of related new products and services across Europe for end users' beneficiary.

Keywords: 3D Multimedia Services, 3D Media Coding, 3D Media Network Protocols, 3D Quality of Experience, 3D multimedia transmission

Working Groups

WG1 3D Content Creation
WG2 3D Media Coding
WG3 3D Content-Aware in Ubiquitous Networking Environment
WG4 3D QoE-QoS Evaluation
WG5 3D End-User Devices
WG6 Next Generation 3D Multimedia



Action IC1106

Integrating Biometrics and Forensics for the Digital Age

Objectives

The aim of this Action is the stimulation of an innovative and timely cooperation between two established research communities: the biometrics community (focused on the reliable identification of individuals) and the forensics community (focused on the broad application of science to crime investigation). The goal is the imaginative integration of their skills and activities to create a new, vibrant and highly effective community capable of developing novel solutions in the fight against crime. The key characteristic embraced by this Action will be its multidisciplinarity, building on excellence in domains ranging from conventional forensic science, to computer science, system engineering, pattern recognition, digital networking, behavioural science, and legal issues. This Action will deliver concrete examples of collaborative research, promote new and vibrant partnerships across geographic and disciplinary boundaries, will create a self-sustaining network of highly engaged researchers and practitioners, encourage mobility, enhanced experiential learning and high quality training opportunities for young researchers and develop a new perspective and radical vision for how criminal investigation is to be conducted in the digital age.

Abstract

"Forensics is the application of a broad spectrum of sciences to answer questions of interest to a legal system. This may be in relation to a crime or a civil action" [Wikipedia]. Since many such questions boil down to identifying, or verifying the identity, of people allegedly involved in some action, a clear relationship exists between forensics and biometrics. Biometrics developed a number of techniques, which can clearly facilitate the identification of people involved in criminal actions or civil incidents. Thus, although the two communities have traditionally often operated in relative isolation, there are many scenarios where the synergic cooperation of multimodal biometrics and forensics can be successfully applied. To address such multifaceted areas it is important to develop an interdisciplinary network with complementary competences, to foster the birth of a new community, which can develop novel technological solutions to crucial issues and new challenges in forensic science. This Action will promote new partnerships, will provide education and training, will contribute to develop new standards and best practices, will produce awareness of the potential benefits of advanced technologies for evidence analysis in forensic cases and will stimulate improved mutual understanding of collaborative working models linking the academic and industrial sectors.

Keywords: Forensics, Biometrics, Identification, Video Surveillance, Pattern recognition

Working Groups

WG1 Biometric evidence for forensic evaluation and investigation
WG2 Audiovisual biometrics for multimedia forensics
WG3 Forensic behavioural and soft biometrics
WG4 Biometric analysis of forensic traces and their interpretation
WG5 Multimodal biometric evidence and its combination with other forensic evidence
WG6 Ethical and societal implications of emerging forensic biometrics

Non-COST participation: Australia, China, Hong Kong, USA

Action TU1104

Smart Energy Regions

Objectives

The aim of the Action is to investigate the drivers and barriers that may impact on the long-term creation of low carbon regions in Europe. The Action will identify what can be done to assist the large-scale implementation of low carbon technologies and processes, focussing on the built environment, in relation to the long-term development programme of smart regions. The main focus will be on both new and retrofit of existing buildings, their operation, embodied energy demand, and the potential for using low and zero energy supply.

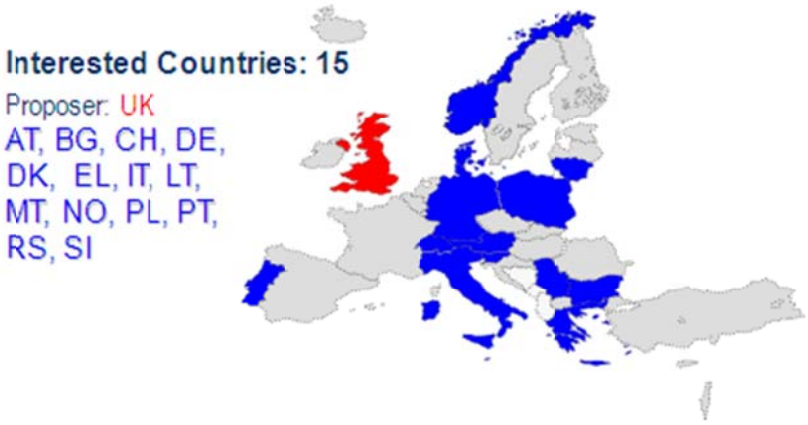
Abstract

Low carbon technology is advancing. Government policy throughout the world needs to achieve considerable reductions in CO2 emissions over a relatively short time scale to avoid catastrophic climate change. The built environment needs to play a major role in CO2 reductions and needs to be addressed at a large scale. A broad set of issues have a significant impact on the successful adoption of new technologies and processes on a larger scale to create a low carbon built environment, including a lack of flexibility and shortage of skills in the supply chain, a misunderstanding of capital and operational costs, where technologies can be implemented, the impact on quality of life and policy and planning for the future. These need to be understood to enable technologies to be widely applicable and transferable within and between regions. This Action will investigate the drivers and barriers that may impact on the long-term creation of low carbon regions in Europe. It will identify what can be done to assist the large-scale implementation of low carbon technologies and processes. The main focus will be on new and retrofit of existing buildings, their operation, embodied energy and potential for using low and zero energy supply.

Keywords: Low carbon, region, built environment, implementation, processes

Working Groups

WG1 Policy, industry innovation and case studies
WG2 Skills, knowledge, training and supply chains
WG3 Cost and Value
WG4 End User Engagement and Dissemination



TU1105

NVH analysis techniques for design and optimization of hybrid and electric vehicles

Objectives

The aim of the Action is to acquire, unify and coordinate necessary information about vehicle dynamics, driveability and noise, vibration & harshness (NVH) analysis technologies in view of the challenges posed by the hybrid and electric vehicles.

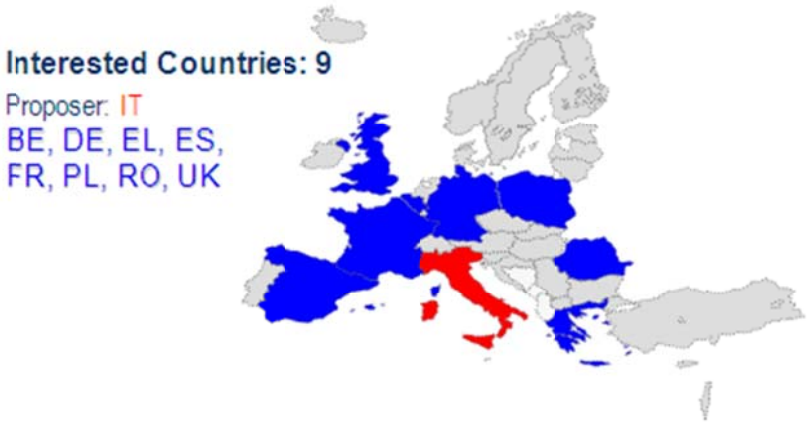
Abstract

The socio-economic quest towards developing transportation with lower CO2 emission is a global goal of the EU and a crucial ingredient for the competitiveness of the whole European transportation industry. It forces an increased focus on alternative powering systems such as electric and hybrid drives. To be competitive, however, such vehicles must have an acceptable Noise, Vibration and Harshness (NVH) behaviour, not only inside the vehicle, but also outside if it is not to pose major concerns regarding safety of weaker road users such as two-wheelers and pedestrians. Most of the NVH design and problem-solving knowledge gathered has concentrated on internal combustion vehicles and so novel analysis techniques have to be developed for vehicles with these new drives. In addition the limited knowledge on electric and hybrid vehicles is scattered all over Europe. The aim of this COST Action is to engage NVH experts from vehicle industry and renowned research groups in the accumulation, development and dissemination of such novel techniques. The COST framework provides the unique opportunity to bring together experienced academic and early-stage researchers, European authorities for transport regulations, independent consultants, experienced representatives from industry and associations of transporters.

Keywords: Electric and hybrid vehicles, vehicle design, vehicle and pedestrian safety, Vibration & Harshness (NVH), sound and vibration

Working Groups

WG1 Work plan and methods related to the collection of existing NVH knowledge concerning ICE vehicles
WG2 Work plan and methods related to the collection of factors that influence the customer annoyance acceptance of HEV technologies
WG3 Work plan and methods related to charting the NVH behaviour of HEVs and EVs by development and application of interior and exterior soundscaping technologies
WG4 Work plan and methods related to a technology roadmap
WG5 Work plan and methods related to structural-acoustic measurements and jury tests



Action TD1106

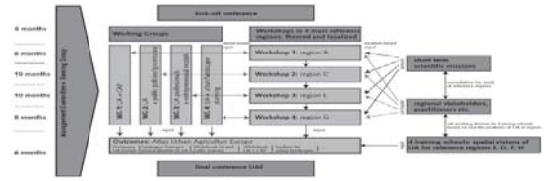
Urban Agriculture Europe (UAE)

Objectives

The main objective of the Action is to develop a common, specifically European approach to urban agriculture among European scholars and professionals in this field. This will be established by the method of a European Atlas on Urban Agriculture grounded in field experiences and reference regions and will serve European policy makers for the further development of the Common Agriculture Policy.

Abstract

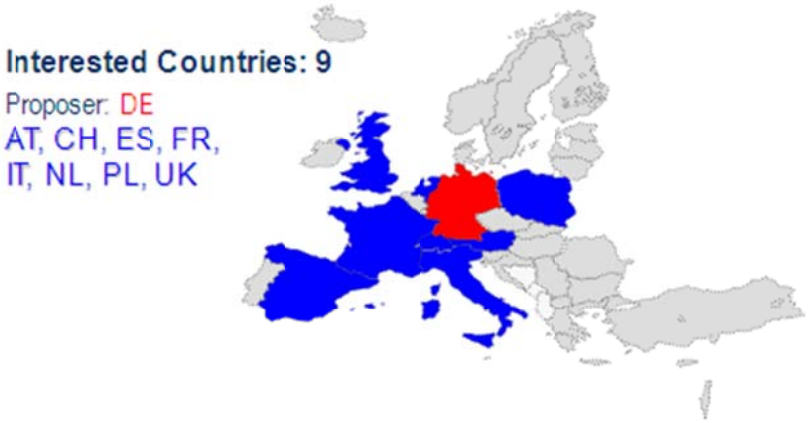
Urban Agriculture (UA) plays a key role in two global challenges: urbanization and food security. It can provide an important contribution to sustainable, resilient urban development and the creation and maintenance of multifunctional urban landscapes. In the globally emerging research field of UA, a European approach to the subject needs to be created. It has to integrate the unique European context regarding its urban and landscape pattern, the important role of the Common Agriculture Policy (CAP) and the needs of the European society. The COST-Action Urban Agriculture Europe (UAE) will initiate the definition of this European approach on the basis of existing research projects and reference regions in the partner countries. The outcomes of the Action will help to focus future research on UA, modify the CAP and stimulate private and public activities in UA projects and planning. The Action will use an innovative approach crossing bottom-up and top-down methods, using the method of research by design and creating interfaces between the three methods. By working in close cooperation with regional stakeholders from the domains of urban development and agriculture the Action contributes to sustainable, resilient territorial development in Europe and aims for leadership in research on UA in developed countries.



Keywords: urban and peri-urban agriculture, sustainable and resilient cities and regions, multifunctional urban landscapes, Common Agriculture Policy (CAP), social inclusion and healthy food

Working Groups

WG1 Urban Agriculture and the Common Agrarian Policy (CAP)
WG2 Urban Agriculture in public policies/governance
WG3 Professionals and entrepreneurial models of Urban Agriculture
WG4 Urban and landscape planning with urban agriculture



Participation of Non-COST countries

Life Sciences

Biomedicine and Molecular Biosciences (BMBS)

Food and Agriculture (FA)

Forests, their Products and Services (FPS)

Natural Sciences

Chemistry and Molecular Sciences and Technologies (CMST)

Earth System Science and Environmental Management (ESSEM)

Materials, Physical and Nanosciences (MPNS)

Science in Society

Individuals, Societies, Cultures and Health (ISCH)

Information and Communication Technologies (ICT)

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