Action BM1306

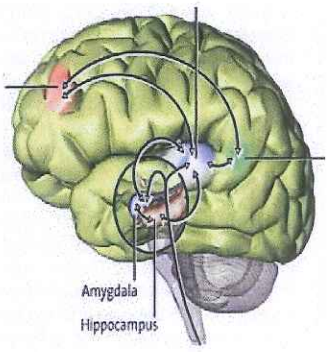
Better Understanding the Heterogeneity of Tinnitus to Improve and Develop New Treatments (TINNET)

Objectives

The aim of the Action is the creation of a pan-European network to identify pathophysiologically and clinically meaningful subtypes of tinnitus and their neurobiological underpinnings. This will be facilitated by standards for clinical assessment and outcome measurement, by large-scale multi-centric data assessment and by data management in a quality controlled database. These data will be complemented by neuroimaging and by the search for genetic markers. Tinnitus is highly prevalent, can cause a high burden in concerned individuals and has enormous socio-economic impact. First promising new treatment approaches have been developed in the past few years, but their further development is hampered by the pathophysiological diversity of tinnitus, resulting in high interindividual variability in treatment outcomes. Thus the traditional research structure of many groups working largely in isolation and investigating small samples is insufficient for addressing the heterogeneity of tinnitus and for identifying valid subtypes.

Abstract

Tinnitus is the perception of sound in the absence of an environmental acoustic stimulus. In Europe over 70 million people experience tinnitus and for 7 million it creates a debilitating condition. There are no established treatment approaches available for curing tinnitus. Better treatment is urgently needed.
Brain research has created a paradigm shift by demonstrating that tinnitus is the consequence of altered neural activity in specific brain networks rather than an ear problem. Based on the understanding of tinnitus as brain disorder, first promising therapeutic approaches have already been developed by individual groups participating in this Action.
However further development is hampered by the heterogeneity of tinnitus and limited knowledge about the neuronal underpinnings of the different tinnitus subtypes.
This Action will foster the establishment of a pan-european multidisciplinary network with the major goal to facilitate (1) the identification of meaningful criteria for tinnitus subtyping, (2) the neurobiological underpinnings of the different tinnitus subtypes and (3) their relevance for response to treatment. This knowledge is essential for developing of new treatment approaches, their clinical investigation and the speed of translation into marketable products.
This COST Action intends a stepwise approach which involves identification of (1) meaningful clinical and demographic characteristics for tinnitus subtyping, (2) tinnitus related changes of brain activity in the different forms of tinnitus, (3) intermediate genetic phenotypes for the identification of genetic factors in the pathogenesis of tinnitus and (4) predictors for response to various treatments. This approach requires a coordinated effort from basic scientists, technicians and clinicians of different disciplines working together in ongoing close collaboration.



Keywords: otolaryngology, neuromodulation, tinnitus database, pathophsyiology of tinnitus, psychiatry

Working Groups

WG1 Clinical: Establishment of a standard for patient assessment and characterization
WG2 Database establishment and implementation on the website
WG3 Neuroimaging
WG4 Genetics
WG5 Standards for Treatment outcome measurement and central collection of results

Action BM1307

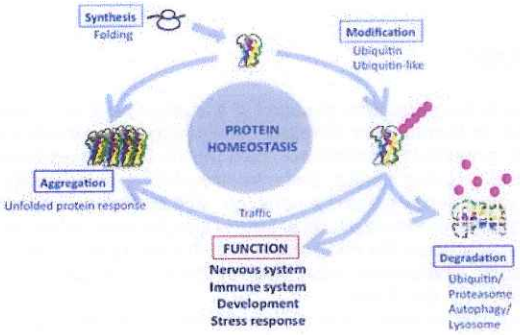
European network to integrate research on intracellular proteolysis pathways in health and disease (PROTEOSTASIS)

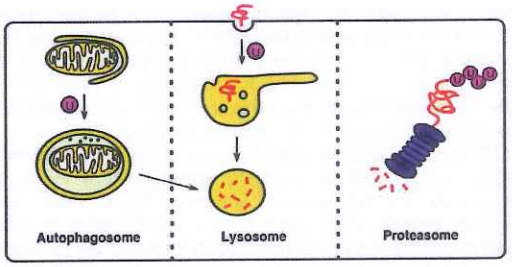
Objectives

The aim of the Action is to promote high-quality collaboration and valorisation among experienced and early-stage academic, clinical and industry-based European researchers involved in intracellular proteolysis research. The expected scientific impact of this initiative is twofold: to increase Europes leadership in this highly competitive field; and to translate scientific knowledge into cutting edge innovations that will improve human health.

Abstract

Intracellular proteolysis is critical for cell homeostasis and to prevent pathologies such as cancers, immune diseases and neurological disorders. Its involvement in the control of almost every biological process has generated a huge interest amongst scientists from very diverse backgrounds, which in turn has resulted into both a tremendous advance of our knowledge and an important fragmentation of the field. The COST Action PROTEOSTASIS will coordinate and integrate the efforts made by European research teams to better understand intracellular proteolysis and to translate novel discoveries into products of clinical and/or economical values. It will gather all European academic, clinical and industrial partners willing to foster collaboration and training in the field through the organization of meetings, workshops and exchange programs. The implementation of different translational projects within the network will generate a "mind-agitating" atmosphere that will promote both creativity and reactivity. To help overcome the energy-barrier that too often limits development of novel and original ideas and concepts, a core dedicated think-tank created within PROTEOSTASIS will detect outstanding and clinically relevant projects that cannot be productively tackled by individual teams and help to assemble both the appropriate funding and workforce required to translate them into medically-valuable applications.

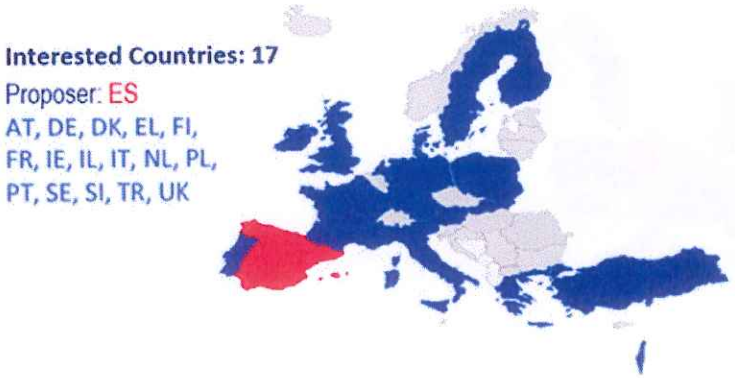




Keywords: Ubiquitin, Ubiquitin Proteasome System, Ubiquitin-like proteins, Proteases, Autophagy

Working Groups

WG1	Protein modification in intracellular proteolysis: mechanisms, roles and regulation.
WG2	Intracellular proteolytic systems: mechanisms, structures and regulation.
WG3	Regulation of cell signalling.
WG4	Protein quality control, misfolding and aggregation.
WG5	Regulation of cell proliferation and differentiation.
WG6	Molecular bases of diseases, biomarkers, drug targets and biotechnology.



Action BM1308

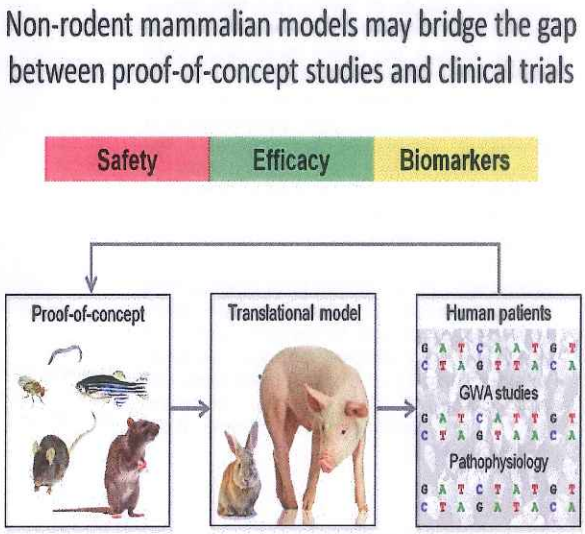
Sharing Advances on LArge Animal Models (SALAAM): Sharing advances in genetic engineering and phenotyping of non-rodent mammals to develop predictive animal models for translational medicine

Objectives

The main objective of the Action is to create a European network of excellence with competence on all levels to create synergies, to optimize the use of human and financial resources and foster the value of large, i.e. non-rodent animal models for European R&D operations. This will be achieved by bringing together researchers from different European countries, who are currently working on different aspects of genetic engineering and phenotyping of large animal models as well as their ethical evaluation and communication to the general public.

Abstract

The translation of novel discoveries from basic research to clinical application is a long, often inefficient and costly process. Consequently, "Translational Medicine" has become a top priority. Appropriate animal models are critical for the success of translational research. The choice of species will always depend on the specific problem that a research study aims to address. Although rodent models are widely used, they often fail to provide an accurate representation of the human disease. Thus, there is an urgent need for non-rodent animal models that mimic aspects of human anatomy and physiology more closely. Pigs, small ruminants and rabbits are excellent candidates. This Action will (i) share information and technology for the development of tailored large animal models; (ii) develop criteria for selection of the species most suitable as a model for the question under investigation; (iii) establish and validate standardized phenotyping protocols; (iv) create a database of existing models, tissue samples, and validated phenotypic assays; and (v) develop and communicate concepts for the scientific and ethical evaluation of experiments with large animals, including involvement of the regulatory authorities. In fostering translational research in Europe the Action supports the objectives of the Amsterdam Treaty.



Keywords: Large animal model; genetic engineering; phenotyping; standardisation; biobank

Working Groups

WG1 Improved technology for tailoring large animal models
WG2 Definition of the most pertinent models and standardization of phenotyping methods
WG3 Database of models, tissues and protocols
WG4 Animal welfare, ethical issues and communication to the public

Action BM1309

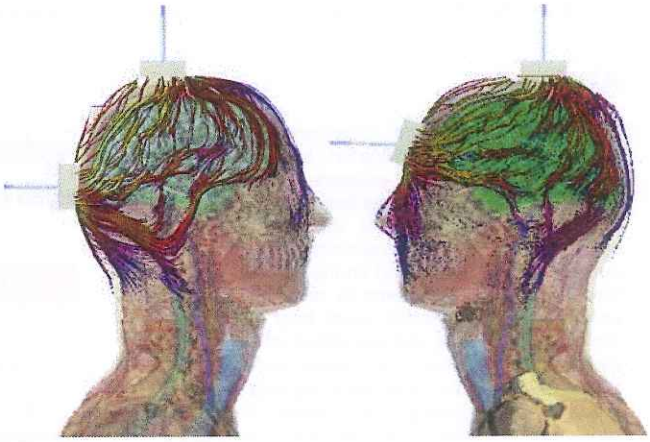
European network for innovative uses of EMFs in biomedical applications (EMF-MED)

Objectives

The aim of the Action is to build an interdisciplinary European network for innovative uses of EMFs in biomedical applications.

Abstract

The Action will provide a cooperative framework to support the research on beneficial biological effects of non-ionizing electromagnetic fields (EMFs) and their use in biomedical applications. Research on biological effects of EMFs has traditionally focused on health risks. Inspired by promising recent studies on useful biomedical EMF interactions and applications, this Action will focus on beneficial effects, aiming for breakthrough results, new discoveries and innovative biomedical technologies. The Action will provide a better understanding of underlying physical and biological interaction mechanisms, related to both cancer and non-cancer applications, filling the gaps in the present state of knowledge. Ultimately, the Action will aim to contribute to development and optimization of innovative EMF-based medical devices and procedures, which will be safer, more efficient and less invasive. Interdisciplinarity of the proposed topic and significance of the expected outcomes require a concerted research network at the European level.

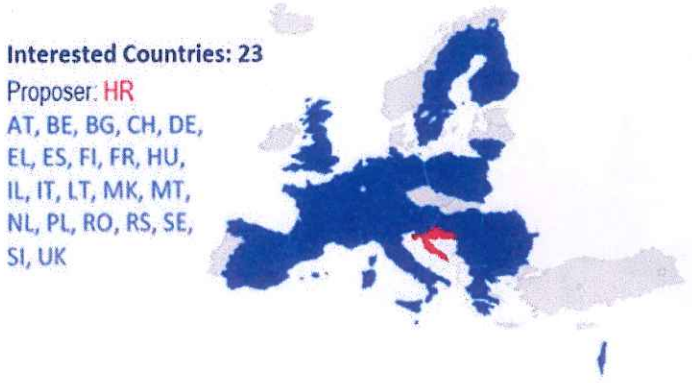


Keywords: beneficial effects of EMFs, biomedical applications of EMFs, cancer and non-cancer interactions, EMF stimulation of cells and tissues, measurements and in silico tools for EMF dosimetry

Working Groups

WG1 Cancer EMF interactions and applications
WG2 Non-cancer EMF interactions and applications
WG3 EMF dosimetry - in silico tools & measurements

Non-COST participant: USA



Action CM1307

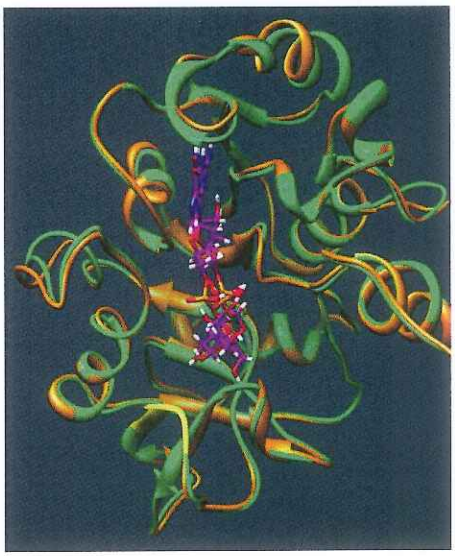
Targeted chemotherapy towards diseases caused by endoparasites

Objectives

The aim of the Action is to define optimal strategies for the discovery of new bioavailable antiparasitic drug-candidates active against pathogenic protozoa and helminths which can be developed into clinically useful drugs for the treatment of parasitic diseases of humans and their farm animals.

Abstract

Advances in the chemotherapy against human and animal parasitic diseases remain limited largely because drug candidates have low specificity and show poor *in vivo* bioavailability. The Action aims at uniting scientists with different backgrounds to create synergistic interactions paving the way for antiparasitic drug discovery for diseases caused by protozoa and helminths.
The scientific aim is to bundle together the identification and validation of parasite drug targets based on the established genomes, medicinal chemistry including structure-based drug design, crystallography, bioinformatics, and drug targeting using chemical and nanotechnological approaches to improve drug performance. Also, rational assessment of the potential of natural product and other compound libraries will be used to identify new leads. Crucially, the Action will create an unprecedented combined forum for human health scientists and veterinarians, because of the enormous unmet needs in treating human and animal parasitic diseases and due to methodological homogeneity of their drug design strategies. The most promising compounds and formulations will be tested in established infection models before further preclinical and clinical development with emphasis on drug safety.
Expected benefits include intensified cooperations between Academia and Industry. This will be achieved through focused conferences, networking, a dedicated website and training schools for state-of-the-art technologies.

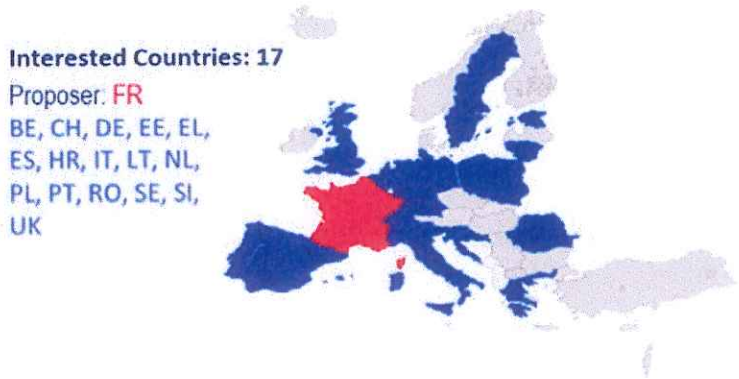


Keywords: Medicinal chemistry, antiparasitic chemotherapy, chemical tools for parasite imaging, drug design, drug targeting

Working Groups

WG1	Identification, characterization and validation of biological targets for chemistry (biochemistry/molecular biology)
WG2	Drug design and bio-oriented medicinal chemistry to design and synthesize new leads validating the druggability of new targets
WG3	Rational evaluation of potential anti-infective hits and lead compounds derived from natural sources
WG4	Drug targeting to enhance efficacy and diminish toxicity of antiparasitic drugs

Non-COST participant: India, USA, Uruguay



Action ES1307

Sewage biomarker analysis for community health assessment

Objectives

The aim of the Action is to develop and expand the existing pan-European inter-disciplinary SCORE network to provide insights into how sewage biomarker analysis can be used to inform on different aspects of community health. It is proposed that the action (i) delivers best practice advice for performing sewage biomarker studies, (ii) consolidates developments with respect to developing new approaches and techniques, (iii) facilitates greater interaction between different disciplines, (iv) identifies research needs, (v) facilitates the exchange of ideas and (vi) generates projects at the forefront of research, (vii) serves as forum for early stage and young researchers to network and present results and (viii) develops new transdisciplinary partnerships.

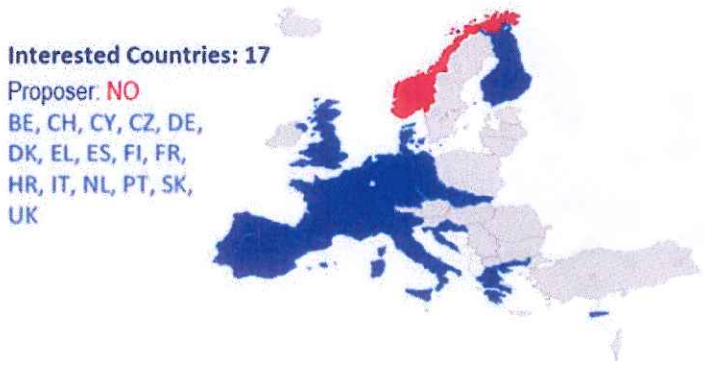
Abstract

Sewage contains the excreted biomarkers of endogenous human metabolism that directly reflects the exposure and stressors placed upon an entire contributing community. The quantitative measurement of these specific biomarkers in sewage from communities allows the averaged patterns of factors related to lifestyle, disease and environment to be used for the assessment of community health. The Action will develop and expand an existing pan-European inter-disciplinary network, bringing together experts from relevant disciplines interested in the application and development of using the quantitative measurement of human biomarkers in sewage to evaluate lifestyle, health and exposure at the community level. In order to achieve its objectives the Action will manage a common Europe-wide testing platform that will develop best practice, provide a significant increase in the comparable spatio-temporal resolution of available data, coordinate the development of new biomarkers in sewage with focus on new psychoactive substances and new biomarkers for the community assessment of factors such as environment, health, lifestyle and diet, and integrate sewage-based approaches with other available metrics. The Action will have a major impact on the development of this emerging field and ensure that the technology is used in a responsible and effective manner and its potentially fully exploited in collaboration with end-users.

Keywords: Sewage analysis, epidemiology, illicit drugs, biomarkers, health

Working Groups

WG1 Sewage biomarkers analysis: methods and technology
WG2 Innovative techniques for community health assessment
WG3 Integration with epidemiology and social sciences



Action TD1305

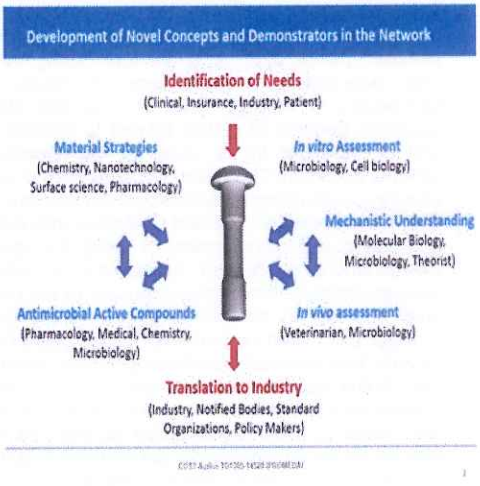
Improved Protection of Medical Devices Against Infection (IPROMEDAI)

Objectives

The COST Action aims at (1) investigating the scientific, engineering and clinical issues that have been identified as the key challenges in addressing the problem of DAI; (2) finding dedicated solutions for the unmet needs in the translational process to applications (points (a)-(e) above); (3) identifying novel designed biomaterials/surfaces with enhanced antimicrobial device functionality and improved long- term stability; (4) documentation of comprehensive sets of standard and novel test methods with appropriate reference materials allowing for comparison of outcomes; (5) establishment of structure/property/function relationships and correlations between in vitro and in vivo data and (6) providing dedicated and integrated training programs across the technical disciplines and socioeconomic aspects of the field.

Abstract

Device-Associated Infection (DAI) constitutes one of the key reasons for clinical failure, impaired functionality, and reduced lifetime of medical devices, resulting in high distress for the patients and huge socioeconomic costs. The prime objective of this Action is the identification and assessment of recently developed anti-DAI approaches in a comprehensive Pan-European effort. Understanding and combating DAI is a device-dependent, highly complex and transdisciplinary challenge requiring collaborations between clinics to define the practical boundary conditions and unmet needs, material and surface engineering to elaborate on enhanced material/drug combination systems, pharmacology and (micro)biology to explore novel antimicrobial active compounds and establish advanced, DAI-relevant test systems in vitro as well as in dedicated animal models. The most promising concepts and engineered prototypic devices are finally evaluated in a preclinical setting. Action Members from the medical device industry and insurance business will proactively exchange knowledge on technical, regulatory, risk analysis and economic issues, all of which are of utmost importance for a successful translation of academic innovation to engineered systems that fulfil the overall requirements of the different stakeholders involved. This Action will provide an extensive, interdisciplinary training program including scientific/technical, regulatory, market and social skills contents; this will contribute to strengthen the interactions within the Action consortium and improve the chances of early-career researchers on the job market. Overall, success in this Action will contribute to improved healthy-life expectancy of patients, reduction in health care costs, and increase the competitiveness of the European medical device industry on the world market.



Keywords: Life science, medical device, infection, implant, functional material, smart coating, antimicrobial, antibiotic, nanocontainer, drug release, S. aureus, S. epidermidis, biosensor, biocompatibility, toxicity, in vitro assay, in vivo study, regulatory aspect, nanomaterial, bioabsorbable polymer, surface analysis

Working Groups

WG1 Antimicrobial Material & Surface Strategy
WG2 Antimicrobial Active Compounds (AACs)
WG3 Mechanistic Studies, in vitro Testing, Sensing and Modelling
WG4 Advanced *in vivo* Testing and Preclinical Studies
WG5 Clinical Background and Needs

Non-COST participation: Australia