# Shortlisted COST Action proposals for CSO approval

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12 – 13 November 2014, Sofia (Bulgaria)

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# Contents

## Biomedicine and Molecular Biosciences (BMBS)



## Chemistry and Molecular Sciences and Technologies (CMST)



## Earth System Science and Environmental Management (ESSEM)



## Food and Agriculture (FA)



## Forests, their Products and Services (FPS)

## Individuals, Societies, Cultures and Health (ISCH)



## Information and Communication Technologies (ICT)



## Materials, Physics and Nanosciences (MPNS)



## Transport and Urban Development (TUD)



## Trans-Domain Proposals (TDP)



## Interested Near Neighbour Countries & International Partner Countries .. 45

# BM1405

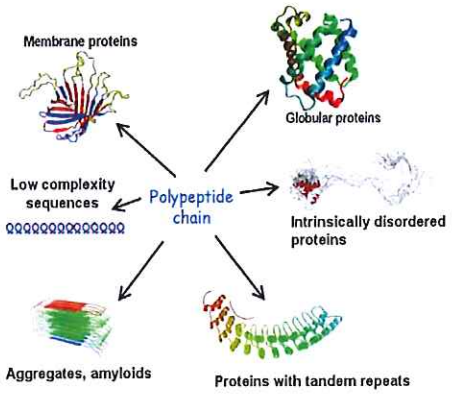
## Non-globular proteins: from sequence to structure, function and application in molecular physiopathology (NGP-NET)

### Objectives

The main aim of this COST proposed Action is to create an effective European network, seeking synergy between participants towards joint activities, enabling the pooling of otherwise fragmented resources and uniting the voices of a large number of European labs, in the better understanding of overlapping NGP phenomena and their joint consensus classification. Various researchers will join forces to develop guidelines in the NGP field by a coordinated consensus approach, including experts in the field, and fostering scientific discussion on the subject. The dissemination to the scientific community of best practices and stimulating a wider scientific discussion on NGP phenomena will thus enhance the quality, translation and impact of European research in a highly competitive and relevant area of biology. Although the Proposal covers a large number of problems at different levels (as structured in the WGs), they all carry as their central theme the problems that come from extensive fragmented resources and conflictual definitions in this field. The network will allow people to share data and experiences, as well as modelling and solving issues in this competitive and challenging area.

### Abstract

Non-globular proteins (NGPs) encompass different molecular phenomena that defy the traditional sequence-structure-function paradigm. NGPs include intrinsically disordered regions, tandem repeats, aggregating domains, low-complexity sequences and transmembrane domains. Although growing evidence suggests that NGPs are central to many human diseases, functional annotation is very limited. It was recently estimated that close to 40% of all residues in the human proteome lack functional annotation and many of these are NGPs. While a better understanding of NGPs is crucial to fully comprehend human molecular physiopathology, progress has been hampered so far by the lack of a systematic approach to their study.
This Proposal aims to create a pan-European scientific network of groups that work on NGPs to strengthen, focus and coordinate research in this field. It proposes to develop a novel classification of NGPs by consensus among interested experts that will be showcased on a newly developed web site, along with meetings, training schools and scientific missions on NGP-related topics.



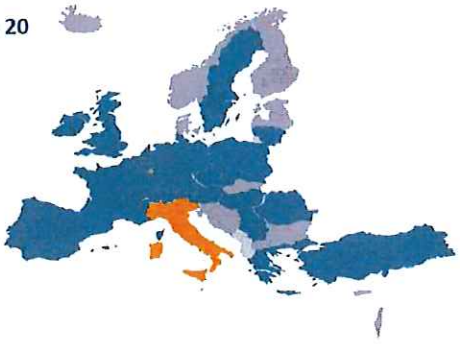

**Keywords**: Computational biology, proteome, intrinsic disorder, tandem repeats, amyloid aggregation

### Working Groups

WG1 NGP Classification and Coordination
WG2 Intrinsic Disorder
WG3 Repeats
WG4 Aggregation

**Near Neighbour Country (NNC): Russia**
**International Partner Country (IPC): Argentina**

**Interested Countries: 20**
Proposer: IT
AT, BE, CH, CZ, DE,
EL, ES, FR, HU, IE,
LT, NL, PL, PT, RO,
RS, SE, TR, UK



# BM1406

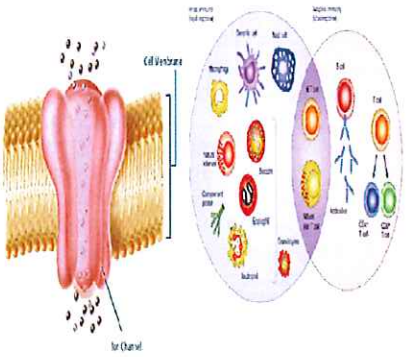
## ION CHANnels and IMMUNe RESPONse Toward a global understanding of immune cell physiology and for new therapeutic approaches (IONCHAN-IMMUNRESPON)

### Objectives

The main objective of the proposed COST Action is increasing and enhancing the knowledge about the role of ion channels in non-excitable cells such as immune cells to develop alternatives therapeutic approaches for disorders associated with immune system dysfunction (autoimmune, chronic inflammatory and allergic diseases as well as transplantation and cancer). This Proposal will bring together leading research universities, international institutes and leading medical industries in its research and training activities to work synergistically in the development of novel targeted therapies. The huge advantage of this Proposal is the availability of integrative approaches involving both biophysics and immunology, combined with cutting edge technologies that can be used as models to address the role of ion channels in immune cells.

### Abstract

The function of ion channels in immune cells is an emerging field of great basic science and clinical interest because they provide powerful molecular targets to modulate immune cell function. The Ionchan-Immunrespon network is a novel and exciting enterprise that involves internationally recognised scientists across 15 European countries. The specific aims are:
i) to develop a strong European workforce to understand the role of ion channels in immune cells, and how deregulation of their function can cause disease,
ii) to identify new targets for therapeutic immuno-interventions through modulation of ion channels. Our unique combination of biophysical approaches combined with molecular biology, cell biology and immunology provides a powerful approach for dissecting the functional cell biology of the immune system.
The Proposal therefore will strengthen academic research in Immunology within Europe and foster closer collaborations with drug and diagnostics development programs in industry.



**Keywords**: Ion channels, immune cells, cancer, auto-immune and inflammatory diseases, therapeutic approaches

### Working Groups

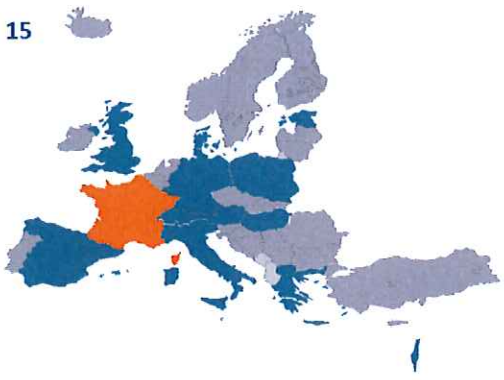
WG1 Identification and Characterization of ion channels in immune cells
WG2 Role of ion channels in immune pathologies
WG3 Ion channels as new targets in therapy and diagnosis

**International Partner Country (IPC): USA**

**Interested Countries: 15**

Proposer: FR

AT, CH, DE, DK, EE,
EL, ES, HU, IL, IT,
LU, MK, PL, UK



# BM1407

## Translational research in primary ciliary dyskinesia: bench, bedside, and population perspectives (BEAT-PCD)

### Objectives

The main objective of the proposed COST Action is to create a global Europe-led network of multidisciplinary primary ciliary dyskinesia (PCD) clinicians and researchers. The network will promote research from basic science to clinical care, with the ultimate goal to develop treatments that lead to measurable improvements in long-term outcome of patients with PCD.

### Abstract

Primary ciliary dyskinesia (PCD) is a rare genetic disease affecting approximately 1:10,000. Cilia that line the respiratory tract are dysfunctional and cannot clear mucus properly leading to progressive upper and lower airway disease, including bronchiectasis, hearing impairment and chronic sinusitis. Cilia are common structures throughout the body, so PCD may affect other organs, for example leading to situs inversus, congenital heart defects or infertility. Mutations in 30 different genes have been identified to date, accounting for approximately 60% of PCD. The clinical picture is very heterogeneous, and as for other rare diseases data on the natural course, phenotypic variability, associations with genotype, and effectiveness of treatments of PCD are scarce. Strategies to manage PCD are derived from other diseases, and are controversial. Scientists, clinicians, allied health professionals and patient representatives unite in this Proposal, providing a platform for communication and exchange. The proposed COST Action will facilitate PCD-related research to identify mechanisms, study disease patterns and progression, define outcome measures, improve clinical management and identify high priority therapies. This Proposal is a platform for preclinical studies that will lead to clinical trials.

**Keywords**: primary ciliary dyskinesia, outcome measures, in vivo models, clinical trials, molecular therapy

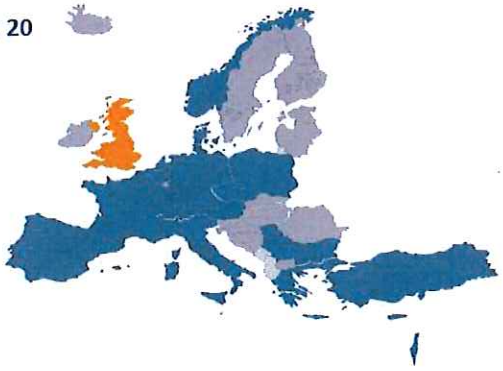
### Working Groups

WG1 Basic science
WG2 Epidemiology
WG3 Clinical care
WG4 Clinical trials

**Near Neighbour Country (NNC): Palestinian Authority**
**International Partner Country (IPC): Canada, India, USA**

**Interested Countries: 20**

Proposer: UK
AT, BE, BG, CH, CY,
CZ, DE, DK, EL, ES,
FR, IL, IT, NL, NO,
PL, PT, RS, TR



# BM1408

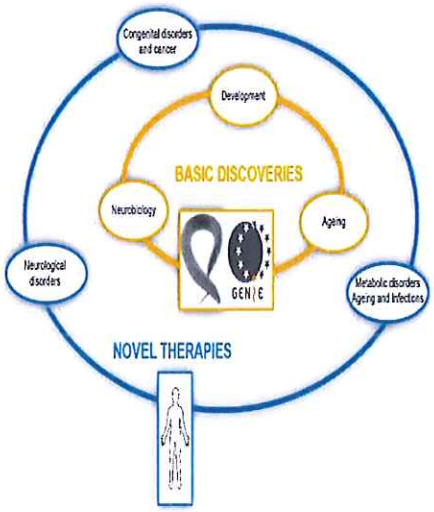
## A collaborative European network of C. elegans early-stage researchers and young principal investigators (GENiE)

### Objectives

The main objective of the COST proposed Action is to promote and co-ordinate the use of C. elegans for basic 'blue-skies' research as a model for human disease and bridge the gap between fundamental research and therapeutic innovation. The Proposal establishes a network of young C. elegans researchers (GENiE) and promotes collaborative interdisciplinary approaches through the creation of a centralised communications platform across Europe. As the current European C. elegans community is fragmented and lacks opportunities to interact, this Proposal, led by and focusing on young Principal Investigators (PIs) and ESRs, will foster high-quality collaborative research and build research capacity by pooling expertise. Target audiences include C. elegans researchers and the wider biomedical research community, the general public, policy makers and industry members.

### Abstract

The main objective of this proposed COST Action is to promote the use of C. elegans for basic 'blue-skies' research and as a model for human disease, drug development and pre-clinical trials, through the establishment of a network of young C. elegans researchers acting as leading scientists and the creation of a centralised communications platform across Europe. The nematode C. elegans has been instrumental in the discovery of conserved principles of fundamental biological processes, leading to novel therapies for a broad range of human diseases.
During the last decade, Europe has seen a dramatic increase in the number of laboratories using this model (80 new groups in 18 COST countries) but the community remains fragmented. This COST network is established to build capacity by uniting young European researchers working across three key fields essential to human health: organismal development, neurobiology and lifespan. GENiE (Group of C. elegans New Investigators in Europe) will enhance and speed up state-of-the art European research by promoting interactions and collaborations across Europe, and competitivity with US labs. GENiE will position Europe at the centre of a scientific excellence network dedicated to the discovery of biological principles, the basis of therapeutic treatments of the future.



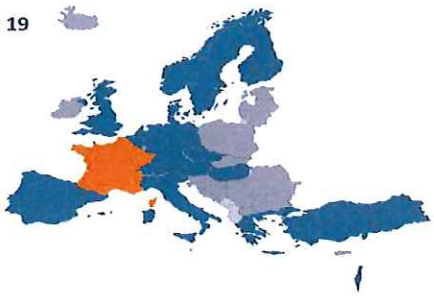

**Keywords**: C. elegans / human disease models / basic biological principles in developmental biology, neurobiology, ageing and immunity / young investigators / basis for innovative therapy

### Working Groups

WG1 Genetics of human congenital disease and regenerative medicine
WG2 Neurological and behavioural disorders
WG3 Metabolism and healthy ageing
WG4 Technology and Innovation
WG5 Translation
WG6 Networking and public awareness of basic research

**Interested Countries: 19**

Proposer: FR
AT, BE, CH, CZ, DE, DK, EL, ES, FI, HU, IL, IT, NL, NO, PT, SE, TR, UK



# CM1406

## Epigenetic Chemical Biology (EPICHEM)

### Objectives

The main objective of this Action proposal is to establish the first European chemical biology network focused on epigenetics and to increase awareness of epigenetics within the European scientific community. The Action will be broadly based and comprise researchers from academia, research institutes, SMEs and multinational organizations from various disciplines including chemistry and biology.

### Abstract

Epigenetics refers to dynamic changes that occur at the DNA, RNA and protein level in eukaryotes.
Epigenetics is at the heart of gene regulation and determines which genes are activated or silenced. It is of great importance fundamentally and has many exciting translational aspects including therapeutics, microbial pathway engineering and agriculture.
The key objective of the proposed Action is to establish the first European chemical biology network focused on epigenetics. This proposed COST Action will provide common ground for researchers from academia, research institutes, SMEs and multinational organizations. The fruitful interactions between these sectors will lead to the creation of new chemical tools as well as leads for therapeutics and agrochemicals. The Action's second objective is to increase awareness of epigenetics within the European scientific community and it will provide training for ESRs and emphasise inclusiveness by COST priority member countries.

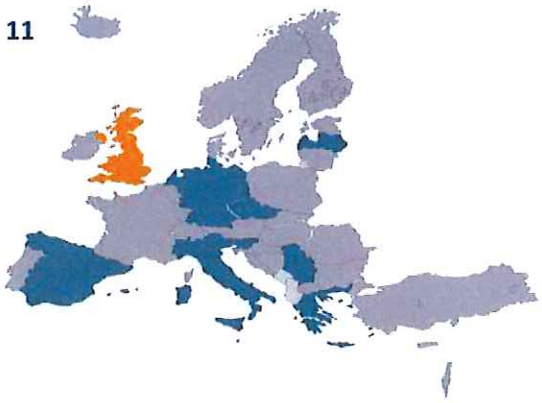

**Keywords**: Epigenetics; chemical biology; drug discovery; food security; proteomics

### Working Groups

WG1 Epigenetic Chemical Probes
WG2 Epigenetic Technology
WG3 Epigenetic Reprogramming

**Interested Countries: 11**

Proposer: UK
CZ, DE, EL, ES, IT,
LV, MT, NL, RS, SI



# CM1407

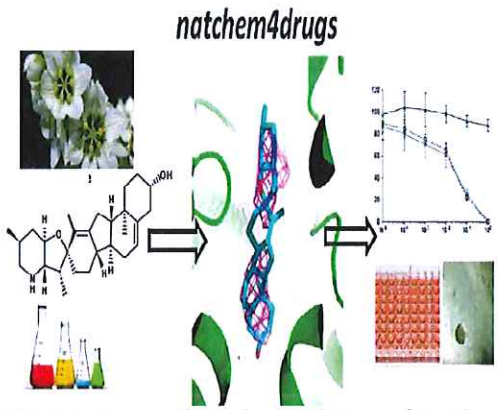
## Challenging organic syntheses inspired by nature: from natural products chemistry to drug discovery

### Objectives

The general aim of this COST Action proposal is to bring together Natural Products (NP) synthesis, computational chemistry, biology and pharmacology in a drug-discovery oriented strategy to provide NP of therapeutic relevance. This approach will be beneficial to both the fields of NP research and drug discovery. The further aim is to promote the translation of research results into possible industrial applications for healthcare. Moreover, the proposed Action will give rise to a new generation of scientists skilled in bioinformatics, biology and NP chemistry and able to cross boundaries of these disciplines.

### Abstract

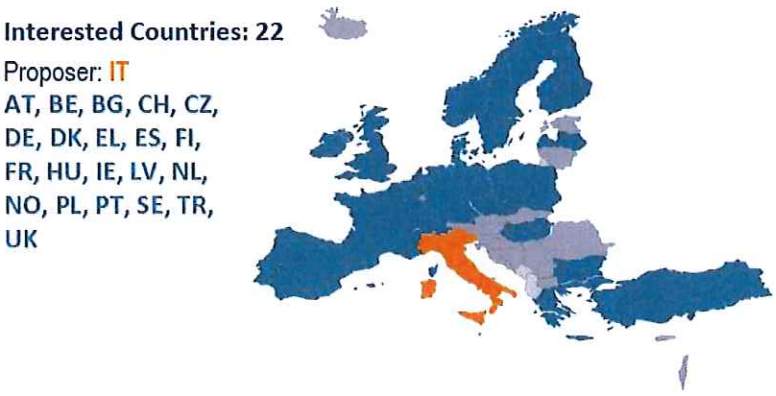
Natural products (NP) have had a major impact on chemistry, chemical biology and drug discovery and have been part of medical remedies since ancient times. Nowadays, NP represent a unique source of leads for medicinal chemistry and drugs derived from NP have found widespread use for the treatment of cancer, cardiovascular diseases, bacterial and fungal infections. The general aim of this proposed COST Action is to advance the field and to maintain the high level of expertise in NP chemistry within Europe by combining synthetic chemistry, computational chemistry, chemical biology, and pharmacology to find new lead structures of pharmaceutical relevance. Since chemistry plays a key role in addressing the industrial requirements for preclinical candidates in terms of physicochemical properties of NP and their analogues, this Proposal further aims to promote the translation between fundamental academic research and industrial drug discovery by means of NP chemistry.




**Keywords**: Natural Products, Organic Synthesis, Drug Discovery, Molecular Modelling, Chemical Biology

### Working Groups

WG1 Optimization of NP chemistry/isolation/purification/characterization
WG2 Viral Infections
WG3 Cancer
WG4 Tuberculosis



# FA1408

## A European Network for Foodborne Parasites (Euro-FBP)

### Objectives

The main objective of EURO-FBP is to decrease the impact on human health from foodborne parasites (FBP) through establishing a risk-based control programme for FBP containing robust and appropriate protective strategies. EURO-FBP will use an interdisciplinary, One Health perspective to assimilate information, coordinate research and harmonize diagnostics, surveillance, analytical methods, potential interventions and mapping of global trends regarding FBP, as well as determine those FBP of greatest regional importance, pinpoint knowledge gaps, and focus resources strategically for control of FBP in Europe - and globally.

### Abstract

The main objective of EURO-FBP is to decrease the impact on human health from foodborne parasites (FBP), through establishing a risk-based control programme for FBP containing robust and appropriate protective strategies. EURO-FBP will use an interdisciplinary, One Health perspective to assimilate information, coordinate research and harmonize diagnostics, surveillance, analytical methods, potential interventions and mapping of global trends regarding FBP. The proposed COST Action will determine those FBP of greatest regional importance, pinpoint knowledge gaps, and focus resources strategically for control of FBP. FBP include protozoa, nematodes, cestodes and trematodes. Although a significant public health issue, FBP have been neglected compared with other foodborne pathogens such as viruses or bacteria. Furthermore, globalisation and changes in climate, agricultural practices, and human behaviour and lifestyles all contribute to emergence of FBP in new settings, with new hosts and transmission routes. Previously associated with specific regions, FBP are now spreading. FBP research is fragmented and groups often focus on a single genera or group of parasites. Hence COST is ideal for EURO-FBP, enabling collaboration among scientists that rarely interact. The agenda will focus on how to address FBP, optimising efforts and resources in order to control FBP in Europe - and globally.

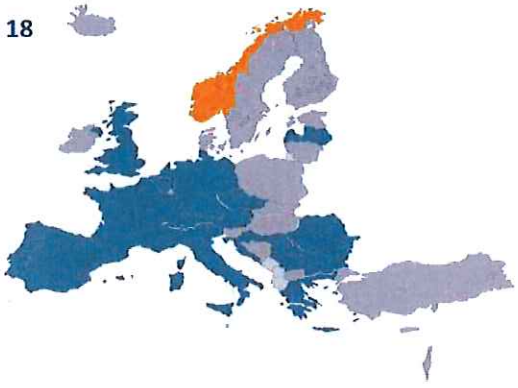

**Keywords**: Foodborne parasites, transmission, surveillance and control, epidemiology and One Health, future trends

### Working Groups

WG1 Region-specific ranking of FBP and current surveillance systems
WG2 Analytical and Diagnostic Methods for FBP
WG3 Interventions
WG4 Global trends, risk assessment and research agenda consolidation and prioritisation

**Interested Countries: 18**

Proposer: NO
AT, BE, BG, CH, CZ,
DE, EL, ES, FR, HR,
IT, LV, NL, PT, RO,
RS, UK



# IS1408

## Industrially Contaminated Sites and Health Network (ICSHNet)

### Objectives

The main objective of the proposed COST Action is to develop a common framework for research and response on environmental health issues in industrially contaminated sites, and establish a European network of experts and institutions involved in assessing the health impacts and/or managing remediation and response. Through expert networking, conferences, workshops, training and dissemination activities, this proposed COST Action will: clarify needs and priorities; support collection of available information, methods and data; promote shared initiatives and develop guidance and resources on risk assessment, management and communication across Europe; allow a comparative reading and interpretation of existing data on health of citizens who live in contaminated sites; create the conditions for the undertaking of comparable health impact assessments of contaminated sites in Europe and beyond.

### Abstract

In Europe, earlier industrialization and poor environmental management practices have left a legacy of thousands of contaminated sites. Past and current industrial activities can cause local and diffuse contamination, to such an extent that it might threaten human health of resident populations, especially in vulnerable subgroup. Moreover, health, environment, and social aspects are strongly interconnected, local communities are often alarmed, and both scientists and policy makers have expressed concern. Distinct research initiatives on the health impact of contaminated sites have provided considerable evidence, however data are sparse, and assessments have seen a fragmentation of objectives and methods. It is therefore urgent to promote coordination and collaboration between researchers and risk managers to identify common strategies at European level to deal with this issue more systematically.

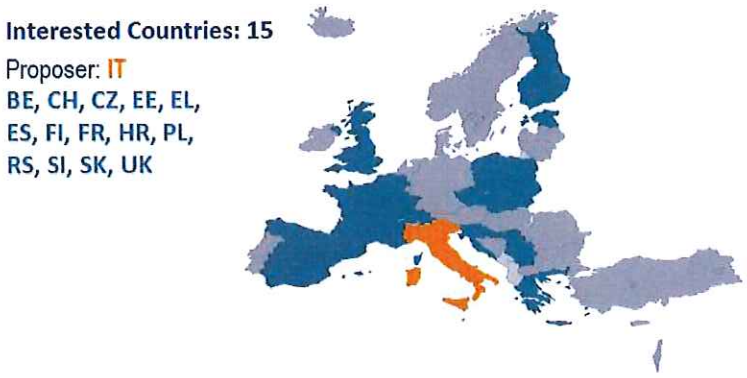
This Proposal aims at establishing and consolidating a European Network of experts and relevant institutions, and developing a common framework for research and response through conferences, workshops, training and dissemination activities.

The Network will: clarify knowledge gaps and research priorities; support collection of relevant data and information; stimulate development of harmonised methodology; promote collaborative research initiatives, and develop guidance and resources on risk assessment, management and communication.

**Keywords**: Human health, industrially contaminated sites, environmental justice and inequalities, health risk-assessment, risk communication

### Working Groups

WG1 Environmental and health data
WG2 Methods and tools for exposure assessment
WG3 Methods and tools for health risk and health impact assessment
WG4 Risk management and communication



# MP1404

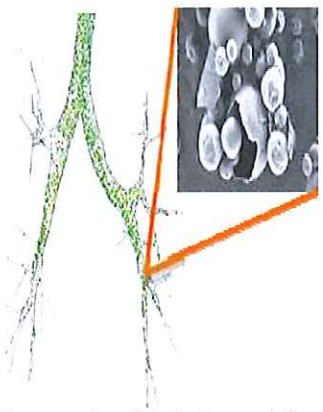
## Simulation and Pharmaceutical Technologies for Advanced Patient-Tailored Inhaled Medicines (SimInhale)

### Objectives

This COST Action Proposal will create and maintain a pan-European multidisciplinary scientific network that will coordinate and enhance research and development (R&D) in the field of inhaled medicines with the aim to accelerate the development of a new generation of effective and safe inhaled medicines. To achieve this overarching goal, the Action will a) seek to overcome knowledge compartmentalization and fragmentation, b) deliver best-practice advice to practicing engineers, scientists and health care professionals, c) establish research and technological priorities, d) deliver consolidated scientific knowledge to decision makers and regulators, e) compile valid and reliable information to be used in regulatory and certification frameworks. Through these high-level objectives the Proposal aims to enhance progress in the field of inhaled medicines, contributing to European scientific and technological excellence, with obvious benefits to society and the economy.

### Abstract

As a result of the culmination of several scientific and technological developments, we are on the verge of technological breakthroughs in the field of inhaled medicines that will revolutionize the treatment of many acute or chronic respiratory and systemic illnesses. However, knowledge in the field is vertically fragmented and compartmentalized in disciplines. As a result, current developments are not necessarily synergistic and supportive of each other. The prospect of patient-tailored inhaled medicines necessitates a much closer coordination of research and development activities. SimInhale aims to create a pan-European network of experts in order to: i) advance particle designs for improved deposition and interaction with lung tissue, ii) promote realistic computer simulations of particle aerosolization, delivery and deposition, iii) promote patient-tailored inhaled medicines, iv) promote integration of device and formulation design, and v) promote critical assessment of toxicity issues and related risks. Making a new generation of advanced inhaled pharmaceuticals available to patients in a shorter period of time will have enormous social benefits. It will also have significant economic benefits, since it will advance pharmaceuticals with higher effectiveness and fewer side effects, thus reducing health care costs in the long run, and will help sustain innovation in the industry of inhaled pharmaceuticals and inhaler devices.

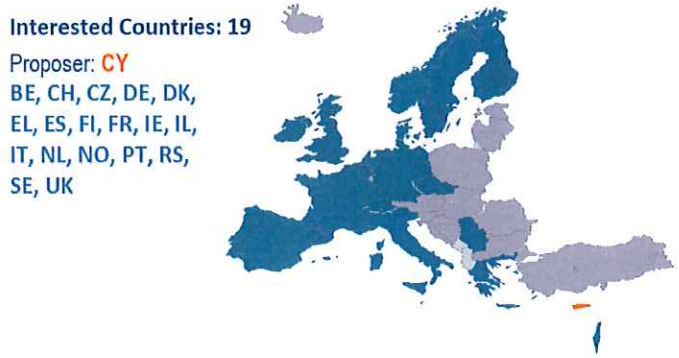


**Keywords**: inhaled medicines and inhaler devices, pulmonary delivery, therapeutic proteins and vaccines, computer simulations, toxicity-related risks

### Working Groups

WG1 Particle engineering/processing of inhaled medicines for local/systemic action
WG2 Device engineering and formulation-aware inhaler design
WG3 Computer simulations as a horizontal enabling technology: delivery, deposition and lung-tissue/particles interaction
WG4 Advanced imaging, patient monitoring and delivery verification
WG5 Toxicity, xenobiotics, risk assessment and policy development

**Near Neighbour Country (NNC): Egypt**
**International Partner Country (IPC): Australia, Singapore, USA**



# TD1407

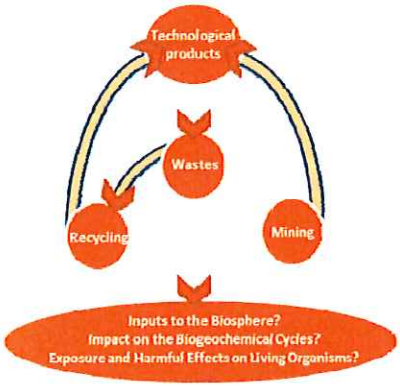
## Network on Technology-Critical Elements – from Environmental Processes to Human Health Threats

### Objectives

The proposed COST Action will create a network of scientists working and interested on TCEs, from an environmental perspective to potential human health threats, with the aim of defining the current state of knowledge and gaps, proposing priority research lines/activities, and acting as a platform for new collaborations and joint research projects.

### Abstract

There are a number of trace elements that were considered just as laboratory curiosities but now, however, are key components for the development of new technologies. For most of these elements, the present understanding of their concentrations, transformation and transport in the different environmental compartments is scarce and/or contradictory. These elements, here defined as technology-critical elements (TCEs) – and include Nb, Ta, Ga, In, Ge, Tl, Te, the platinum group elements (PGE: Pt, Os, Ru, Rh, Pd and Ir), and most of the rare earth elements (REE: Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Yb, Lu) – are undergoing a significant change in their cycle at the Earth's surface due to their increase use in a variety of technological applications. Their impact on their biogeochemical cycles and potential biological and human health threats needs to be further explored.
The holistic approach of the proposed Action will cover research areas like: (i) Analytical challenges for quantitative and screening purposes; (ii) Environmental processes including biogeochemical cycles of the TCEs; (iii) Sustainable resource management: (iv) The exposure of humans to these elements and their compounds through air, water, and food.; (v) Potential ecological and human health threats (eco-toxicology).




**Keywords**: Technology-critical elements, Analytical determination, Speciation, Environmental cycling, Sustainable resource management, Human exposure, Ecotoxicology, Toxicology

### Working Groups

WG1 Analysis and Inter-calibration
WG2 Environmental Impact and Cycling
WG3 Human exposure and (eco)toxicology
WG4 Training and Capacity Building

**International Partner Country (IPC): USA**

**Interested Countries: 16**

Proposer: ES

BE, CH, DE, DK, EE, FR, IE, IT, LU, NO, PL, PT, SE, TR, UK