



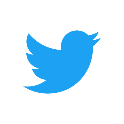
***Beating cancer by 2030:  
mission impossible?***

**COST Connect workshop on  
the future of European cancer research**

**21-22 May 2019**

**COST Association**

**Avenue Louise 149, 15th floor  
1050 Brussels, Belgium**

****

**@COSTprogramme**

**#COSTconnect**

Table of contents

[Methodology 4](#_Toc10811281)

[Programme 5](#_Toc10811282)

[Curing cancer by 2030: mission impossible? 6](#_Toc10811283)

[Funding, coordination and policy context 7](#_Toc10811284)

[About the European Research Area 7](#_Toc10811285)

[Cancer research in the ERA 7](#_Toc10811286)

[About COST and COST Actions 8](#_Toc10811287)

[COST Actions working in the field 9](#_Toc10811288)

[European Research Network on Signal Transduction – CA18133 11](#_Toc10811289)

[Functional Glyconanomaterials for the Development of Diagnostics and Targeted Therapeutic Probes - CA18132 11](#_Toc10811290)

[International Nucleome Consortium – CA18127 12](#_Toc10811291)

[European Cholangiocarcinoma Network – CA18122 12](#_Toc10811292)

[European network for Gynaecological Rare Cancer research: From Concept to Cure – CA18117 13](#_Toc10811293)

[Cancer nanomedicine - from the bench to the bedside – CA17140 13](#_Toc10811294)

[Towards understanding and modelling intense electronic excitation – CA17126 14](#_Toc10811295)

[Identifying Biomarkers Through Translational Research for Prevention and Stratification of Colorectal Cancer – CA17118 14](#_Toc10811296)

[International Network for Translating Research on Perinatal Derivatives into Therapeutic Approaches – CA17116 15](#_Toc10811297)

[European network for advancing Electromagnetic hyperthermic medical technologies – CA17115 15](#_Toc10811298)

[New diagnostic and therapeutic tools against multidrug resistant tumours – CA17104 16](#_Toc10811299)

[Delivery of Antisense RNA Therapeutics – CA17103 16](#_Toc10811300)

[European Network on Pseudomyxoma Peritonei – CA17101 17](#_Toc10811301)

[European Network of Vaccine Adjuvants – CA16231 17](#_Toc10811302)

[LEukaemia GENe Discovery by data sharing, mining and collaboration – CA16223 18](#_Toc10811303)

[Network on the Coordination and Harmonisation of European Occupational Cohorts” (OMEGA-NET) – CA16216 18](#_Toc10811304)

[Brillouin Light Scattering Microspectroscopy for Biological and Biomedical Research and Applications – CA16124 19](#_Toc10811305)

[European Epitranscriptomics Network – CA16120 19](#_Toc10811306)

[In vitro 3-D total cell guidance and fitness – CA16119 19](#_Toc10811307)

[CliniMARK: ‘good biomarker practice’ to increase the number of clinically validated biomarkers – CA16113 20](#_Toc10811308)

[Gene Regulation Ensemble Effort for the Knowledge Commons – CA15205 21](#_Toc10811309)

[Multi-target paradigm for innovative ligand identification in the drug discovery process (MuTaLig) – CA15135 21](#_Toc10811310)

[The comet assay as a human biomonitoring tool (hCOMET) – CA15132 21](#_Toc10811311)

[Diagnosis, Monitoring and Prevention of Exposure-Related Noncommunicable Diseases (DiMoPEx) – CA15129 22](#_Toc10811312)

[Open Multiscale Systems Medicine (OpenMultiMed) – CA15120 22](#_Toc10811313)

[Challenging organic syntheses inspired by nature - from natural products chemistry to drug discovery – CM1407 23](#_Toc10811314)

[Epigenetic Chemical Biology (EPICHEM) – CM1406 23](#_Toc10811315)

[Ion Channels and Immune Response toward a global understanding of immune cell physiology and for new therapeutic approaches (IONCHAN-IMMUNRESPON) – BM1406 23](#_Toc10811316)

[Non-globular proteins - from sequence to structure, function and application in molecular physiopathology (NGP-NET) – BM1405 24](#_Toc10811317)

[European Network of Investigators Triggering Exploratory Research on Myeloid Regulatory Cells (Mye-EUNITER) – BM1404 24](#_Toc10811318)

[Development of a European network for preclinical testing of interventions in mouse models of age and age-related diseases (MouseAGE) – BM1402 24](#_Toc10811319)

[Multifunctional Nanoparticles for Magnetic Hyperthermia and Indirect Radiation Therapy (Radiomag) – TD1402 25](#_Toc10811320)

[Raman-based applications for clinical diagnostics (Raman4clinics) – BM1401 25](#_Toc10811321)

[European network for innovative uses of EMFs in biomedical applications (EMF-MED) – BM1309 26](#_Toc10811322)

[European network to integrate research on intracellular proteolysis pathways in health and disease (PROTEOSTASIS) – BM1307 26](#_Toc10811323)

[Stakeholders in the field of cancer research participating in the event 27](#_Toc10811324)

[Stakeholders funding cancer research 27](#_Toc10811325)

[European Commission – DG RTD 27](#_Toc10811326)

[Joint Programming Initiatives (JPI) – Healthy Diet for a Healthy Life (HDHL) 27](#_Toc10811327)

[European Commission - Marie Skłodowska-Curie Actions 28](#_Toc10811328)

[European Research Council (ERC) 29](#_Toc10811329)

[European Institute of Innovation and Technology (EIT) Health 29](#_Toc10811330)

[ERA Healthy Diet for a Healthy Life (HDHL) 30](#_Toc10811331)

[Innovative Medicine Initiative (IMI) 30](#_Toc10811332)

[Stakeholders representing coordination and policy initiatives 30](#_Toc10811333)

[European infrastructure for translational medicine - EATRIS 30](#_Toc10811334)

[European CanCer Organisation - ECCO 31](#_Toc10811335)

[Association of European Cancer leagues - ECL 31](#_Toc10811336)

[European Cancer Patient Coalition – ECPC 32](#_Toc10811337)

[European Oncology Nursing Society – EONS 32](#_Toc10811338)

[European Society for Radiotherapy & Oncology – ESTRO 33](#_Toc10811339)

[European Technology Platform Nanomedicine – ETP Nanomedicine 34](#_Toc10811340)

[Real-World and Analytical Solutions Global Team – IQVIA 34](#_Toc10811341)

[Politico 35](#_Toc10811342)

[European Commission - Joint Research Centre (JRC) 35](#_Toc10811343)

[ERA-NET - Transcan-2 35](#_Toc10811344)

[Systems Medicine to address clinical needs (ERACoSysMed) 36](#_Toc10811345)

[South East European International Institute for Sustainable Technologies (SEEIIST) 36](#_Toc10811346)

[List of participants 37](#_Toc10811347)

# **Methodology**

COST organises this highly interactive COST Connect event series to bring together representatives of COST Actions as well as scientific communities, stakeholders and policy makers working on the broader topic of cancer.

The methodology of the workshop is based on the concept of the Pro-Action Café, which is an innovative yet simple methodology for creative, inspirational and relevant conversations.

The event has no set agenda and starts with short “setting-the-scene” presentations aiming at providing a general overview of the challenges and activities of the different actors in the field. In a Pro-Action Café, discussion topics are proposed by the participants themselves and selected by the audience, ensuring a maximum engagement and relevant outcomes.

After agreement of the discussion topics, participants invite the audience to define strategies to overcome a specific identified challenge. This is achieved by three rounds of conversation in café style, each guided by a few generic questions to help deepen and focus the conversations. In each round, a new set of participants join the tables, benefiting from the collective intelligence present during the event.

COST Connect events aim at creating synergies and reducing research fragmentation in the field, initiating future research cooperation. They actively promote the COST Actions strategic research roadmaps and, identify new funding opportunities, and priorities for Horizon Europe. Furthermore, the discussions build on COST experiences, bridging the research and innovation divide in Europe.

# **Programme**

21 May 2019

|  |  |
| --- | --- |
| *Networking lunch* | *12.00* |
| **Introduction and welcome**  Prof. Dr Sierd Cloetingh, COST President  Dr Wolfgang Burtscher, Deputy Director General, DG Research and Innovation, European Commission  Dr Ronald de Bruin, Director COST Association | 13.00 |
| **COST setting the scene** | Success stories of COST Actions active in cancer research | 13.15 |
| **Input by Stakeholders** | The state-of-play on cancer research in Europe | 13.30 |
| **Check-in** | All participants briefly introduce their work | 14.30 |
| *Coffee break* | *15.00* |
| **Announcing, discussing and selecting questions**  Participants put forward individual / community challenges and for which they would like to receive input from the collective intelligence. The group then selects the challenges to be prioritised. The owners of the selected questions will be hosting table discussions. | 15.30 |
| **Pro-Action Café round 1: What is the quest behind the question**  Every participant is invited to challenge the table host and different facets of the question are explored. | 16.15 |
| **Pro-Action Café round 2: What is missing**  The participants aim to make the picture more complete, redefine and deepen the discussion on the question (e.g. questions not asked yet, perspectives or options not considered yet). | 17.15 |
| ***Networking dinner*** *(All participants are kindly invited)*  *Restaurant Rouge Tomate, Avenue Louise 190, 1050 Brussels* | *19.00* |

22 May 2019

|  |  |
| --- | --- |
| *Welcome breakfast* | *8.30* |
| **Recap of Day 1** | *9.00* |
| **Setting the Scene** | Part 2 | 9.30 |
| **Pro-Action Café round 3: What is next**  What did we learn? What next steps will each of us take? What are possible actions? | 10.00 |
| *Coffee break* | 11.00 |
| **Presentation of results** | Presentation of the results by the hosts of the tables | 11.15 |
| **Next steps and closing of the meeting** | 12.00 |
| *Networking lunch* | *12.15* |

# **Curing cancer by 2030: mission impossible?**

Curing cancer is one of the major challenges for research and innovation in the years to come. If current trends continue, 1.67 million people in the EU will die from cancer by 2030, making cancer a disruptive disease for patients and their families, healthcare systems and society at large.

The challenges in cancer research are numerous and complex. This is shown by a recent short survey conducted with leaders of research networks, where the following most urgent issues were identified:

* Basic science for understanding cancer
  + A total redefinition on cancer taxonomy
  + Dissecting the basis of tumour heterogeneity starting from cells of origin to conduct solid study of personalized medicine on well and multilevel characterized homogeneous cohort of certain tumour subtypes
  + Tumour resistance
  + Multiscale scenario (from the molecular level up to macroscopic and biological) of the mechanisms behind cancer treatments
  + Reliable and personalized in vitro models
  + Biomarkers and -omics
* New cancer prevention and advancing early diagnosis
  + Environmental and occupational risk factors
  + Personal and lifestyle factors
  + Promotion of a healthy lifestyle since childhood
  + Tumour border detection
* Knowledge-based optimised therapies
  + Novel therapeutic agents with multi-target mechanism of action
  + Novel combined therapeutic strategies
  + Immunotherapy / immune-combination
  + Modulation of epigenetic targets
  + Developing and introducing innovative out-of-the-box (e.g. electromagnetics-based) therapies
* Personalised medicine techniques / precision cancer medicine
  + Improved risk classification
  + Biological characteristics of both the tumour and patient to help guide decisions on which therapies to use
* Data sharing
  + Workable and clear guidelines
  + Big data and artificial intelligence
* The Ethical, Legal, and Social Implications (ELSI) issues
  + Sound ethical practice regarding data ownership
  + Informed consent – assent regarding incidental findings
  + Access to genomic testing and knowledgeability about utility of genomic testing
* Patient-centric approaches
  + Ineffective treatment causing a lot of side effects
  + Non-invasive personalised treatment strategies
  + Non or minimal invasive detection
  + Faster translation into practice
* Multidisciplinary cooperation

Beating cancer will require a multidisciplinary and comprehensive approach, relying on both discoveries in basic research and innovative methods across disciplines. Collaboration will be key by sharing knowledge and the large amounts of available data.

This COST Connect event provides a multidisciplinary platform where researchers, policy-makers, cancer patient organisations and industry will discuss the challenges in cancer research, leading to an improved coordination at European level. The event comes at a crucial time, providing pan-European input into the ongoing Horizon Europe discussions, as curing cancer has been identified as one of the future missions in the next Framework Programme for Research and Innovation.

## Funding, coordination and policy context

### About the European Research Area

The European Research Area (ERA) is a unified research area open to the world and based on the Internal Market. The ERA enables free circulation of researchers, scientific knowledge and technology, opening opportunities in strengthening EU’s scientific and technological bases, competitiveness and capacity to address grand challenges collectively. As the ERA grows stronger, different initiatives are launched increasing the complexity of funding and support mechanisms that are not always easily grasped by researchers.

The ERA results of the coordination of knowledge and research activities and programmes at both national and EU level. This coordination effort is made by the Member States and the EU, strongly supported by the European Universities, Research Centres, and Industry. Together, they identify key topics to address and jointly develop Strategic Research Agendas, work programmes and the most relevant instruments for their implementation.

The ERA is supported via the well-known EU Framework Programme. In general terms, funding in the ERA can be:

* Managed directly by the European Commission or its Agencies (e.g. European Research Council (ERC); Marie Skłodowska Curie, Industrial Leadership, European Institute of Innovation and Technology (EIT) or the Societal Challenges).
* Partnerships with the Private Sector, the Joint Technological Initiatives (JTIs) involving industry, research community and public authorities. JTIs organise their own research agenda and award funding for projects on the basis of open calls (e.g. IMI).
* Member State driven: 95% of EU spending in research and innovation is done at member state level. There are several programmes aiming at pooling national research efforts around topics that Member States cannot tackle on their own (e.g. JPIs - supported via the ERA-NETS, Art. 185, COST).

COST is the longest-running European framework supporting trans-national cooperation among researchers, engineers and scholars across Europe. By promoting open spaces where people and ideas can grow without limits COST is the leading networking tool of the ERA connecting researchers and different initiatives and stakeholders.

### Cancer research in the ERA

Fighting with cancer is an essential part of the research framework programmes funded by the European Commission since 1985. Under Horizon 2020 (2014-20) the current EU framework programme for research and innovation, 980 projects so far have been funded for €1.2 billion. An overview of the several funding schemes on European level is given on page 27.

# **About COST and COST Actions**

The European Cooperation in Science and Technology (COST - [www.cost.eu](http://www.cost.eu)) is an EU-funded programme that enables researchers and innovators to set up their interdisciplinary research networks in Europe and beyond. Currently COST has 38 Members and a Cooperating Member. Funds are provided for organising conferences, meetings, training schools, short-term scientific exchanges or other dissemination activities across a wide range of scientific topics.

COST has been creating networks of excellence in all scientific fields for more than 45 years, where knowledge is widely shared among different types of specialists, using bottom-up principles. Networks are composed of participants active in diverse disciplines from academia, industry and various stakeholders, including European and international organisations. COST nourishes free and open spaces where people and ideas can grow. This helps to internationalise the scientific community and leads to breakthroughs in science and technology in Europe and beyond.

A close up of a logo

Description automatically generated

Figure 1: Data throughout the year 2017.

COST Actions[[1]](#footnote-2) are interdisciplinary networks of researchers and innovators from universities, public and private institutions, NGOs, industry and SMEs. COST funds networks on high-risk, innovative and emerging research themes. COST does not set research priorities; hence, COST Actions can touch on any science and technology topic.

COST Actions can also pave the way to establish synergies with EU-funded research projects. Moreover, collaboration within research projects can also lead to new Actions, thus enhancing the networking potential of such consortia. Every COST Action has an objective, defined goals and clear deliverables. These are described in a Memorandum of Understanding, accepted by at least seven participating COST Members.

On the basis of mutual benefit, researchers and innovators from Near Neighbour Countries and International Partner Countries may join.

# **COST Actions working in the field**

COST has long been attracting research communities working on beating cancer. As open and inclusive networks, COST Actions are the perfect tool to enable collaborations between different scientific fields. Figure 2 below shows the common participation among current COST Actions.

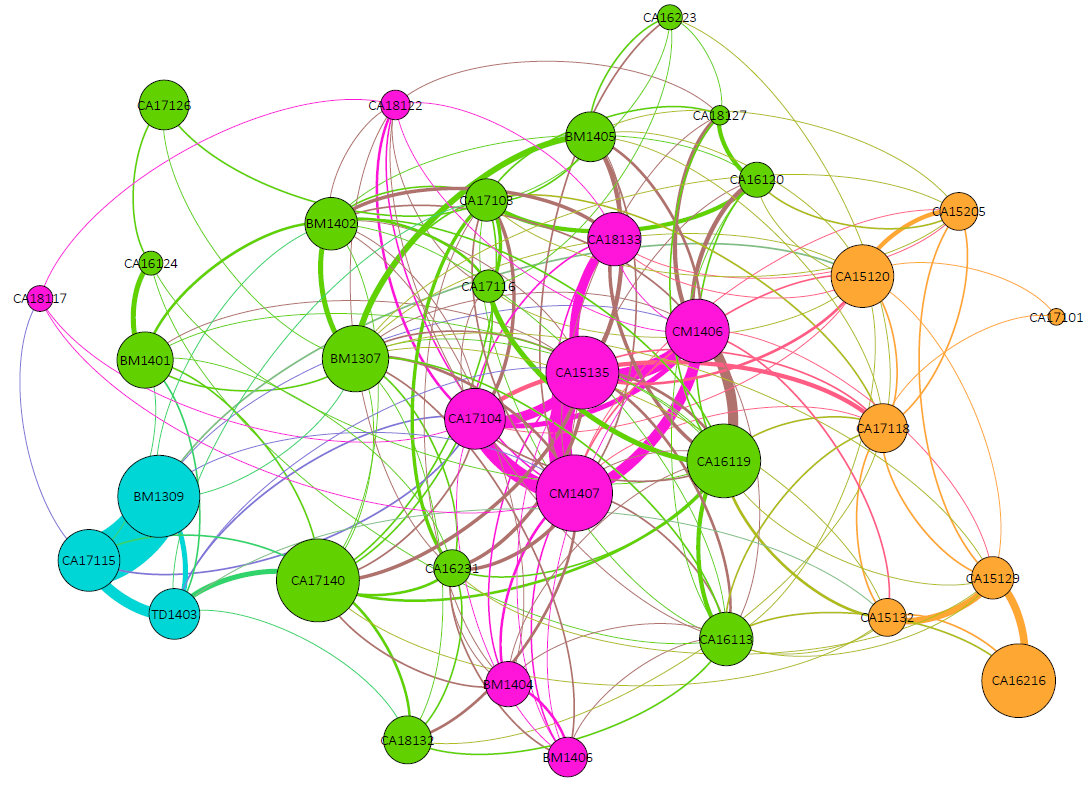


Figure 2: Network analysis[[2]](#footnote-3) based on Management Committee membership of COST Actions working in the field of cancer research since 2014.

It is clear that while some networks are already strongly linked and aware of each other’s work, some COST Actions are still working in relatively small / closed environments. This stems from narrower research topics, e.g. rare cancers (*CA17101 - European Network on Pseudomyxoma Peritonei*), or from research communities looking to apply specific methodologies to several issues including cancer (*CA17126 - Towards understanding and modelling intense electronic excitation*).

These 35 Actions bring together 8.690 unique participants from 82 countries worldwide. The map below gives an overview of all the involved countries in the COST networking activities on cancer research.

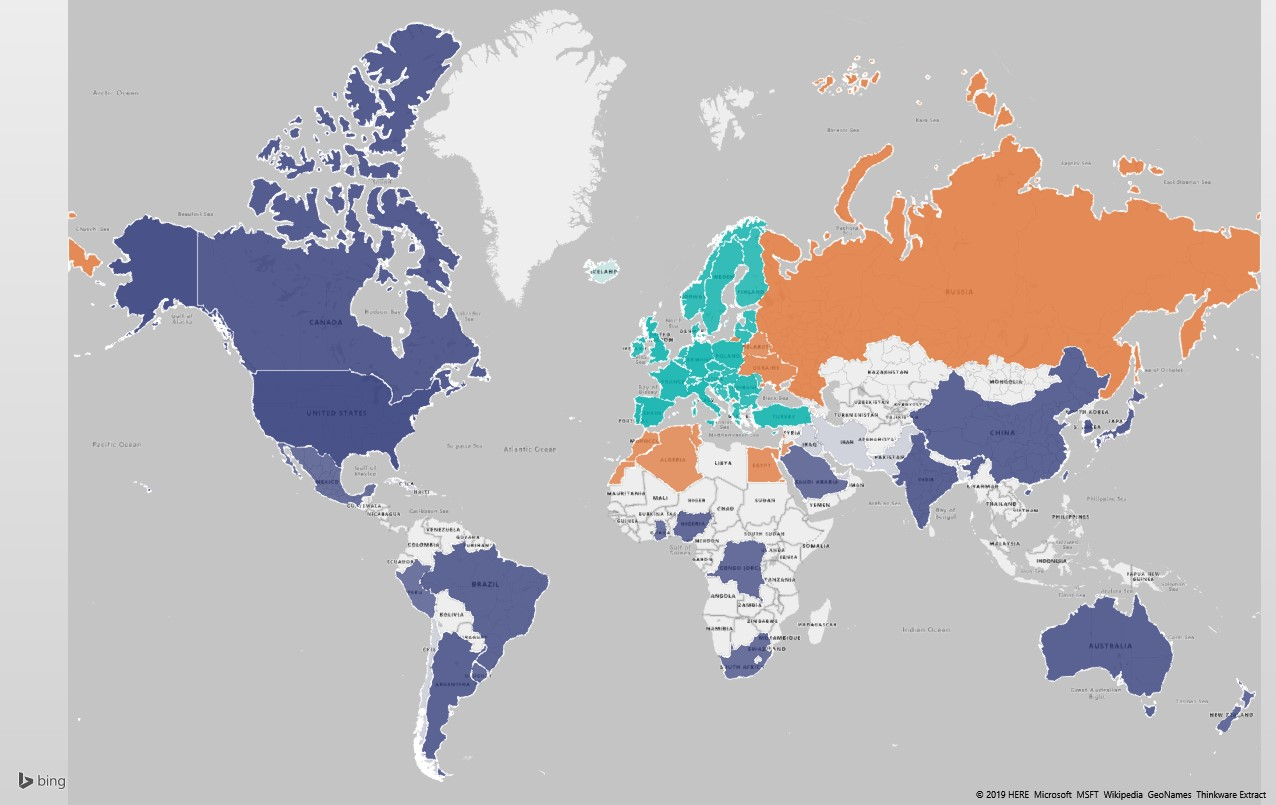


Figure 3: Country of affiliation of the participants collaborating in the 35 COST Actions listed below. In green are COST Members, in orange are Near Neighbour Countries (NNCs) and in blue are International Partner Countries (IPCs).

Listed below are the details of the COST Actions shown above and currently working in the field.

### [European Research Network on Signal Transduction – CA18133](https://www.cost.eu/actions/CA18133/#tabs|Name:overview)

All cells face the vital challenge of sensing their environments and responding in appropriate ways. This process is accomplished by transmembrane signal transduction, which is present in every species and governs every aspect of how an organism functions. In regard to human health, there is a huge drive to understand how transmembrane signal transduction networks function on the molecular, cellular and physiological level so that drugs can be designed to modulate different aspects of the signal transduction cascade in highly specific ways. Despite significant progress in understanding the individual components, signal transduction as a whole is not fully understood. Fundamental questions remain regarding how different signalling pathways are activated and modulated in precise and reproducible ways. Filling this gap in knowledge is absolutely necessary to advance the next generation of drugs that will achieve therapeutic efficacy while minimizing side effects. A prime example of this research challenge is the large family of G protein-coupled receptors (GPCRs), which are the target of more than a third of all marketed drugs. The COST Action ERNEST (European Research Network on Signal Transduction) will tackle this challenge by uniting scientists from different disciplines spanning the molecular, cellular, physiological, and clinical perspectives. This network of diverse investigators will be uniquely able to synergistically develop an unprecedented comprehensive understanding of signal transduction that will advance drug design efforts in Europe, for the benefit of societies and human health worldwide.

Runtime: 2019 - 2023

MC Chair: Dr Martha SOMMER

MC Vice-Chair: Dr Jana SELENT

### [Functional Glyconanomaterials for the Development of Diagnostics and Targeted Therapeutic Probes - CA18132](https://www.cost.eu/actions/CA18132/#tabs|Name:overview)

Carbohydrates, proteins, lipids and nucleic acids are the biomacromolecules that constitute the fundamental building blocks of life. Among those, carbohydrates are key players involved in a myriad of molecular recognition events from protein folding, cell-cell communication, bacterial and viral infections to fertilization. Cell-surface carbohydrates can differ considerably between cell lines and also between healthy and disease states. These differences can be exploited for the development of early diagnostic tools, prevention and/or treatment of diseases via for example molecules/probes that target the interactions between key glycans and their receptors.

However, despite their biological significance and therapeutic potential, these important biomolecules have been investigated to a much lesser extend compared to nucleic acids and proteins. The vast complexity of carbohydrate systems combined with the scarcity of glycan-based tools for study have been a major challenge in glycobiology. Thus, the production of tailored and structurally-defined glycan-based probes for biomedical applications represents a significant advancement in the field.

Nanotechnology provides a new array of techniques and platforms to study glycosystems. Recent developments in the field have provided access to an advanced toolkit of synthetic nanomaterials and the techniques to study such molecules at high resolution. In order to successfully develop new glycan-conjugated and carbohydrate-derived materials, interdisciplinary collaboration between material scientists, chemists, immunologists, microbiologists, molecular biologists and medics is crucial.

The aim of this action is to bring together experts in these different areas from all around Europe to develop the next generation of functional glyconanomaterials for the development of diagnostic tools and targeted therapeutics.

Runtime: 2019 - 2023

MC Chair: Prof. M. Carmen GALAN

MC Vice-Chair: Prof Cristina NATIVI

### [International Nucleome Consortium – CA18127](https://www.cost.eu/actions/CA18127/#tabs|Name:overview)

The genomic revolution has been a unidimensional one. Chromosome maps, sequences, polymorphism databases, the wealth of information that has been and continues to be gained from genomic studies exists independently of the cellular context. Yet our genome lives as a three-dimensional object intricately folded and packaged in the cell nucleus, structured around nuclear bodies and landmarks, acted upon by countless force-generating nano-machines. Ultimately then, understanding how the genome works requires elucidating the structure-activity relationships of the cell nucleus as a complex, dynamics biological system. No doubt this is an ambitious task. But it is also one of the most exciting challenges now facing biomedical research. With the recent advances that have been made in microscopy, biochemistry and modeling, tackling this challenge requires concertation on a global scale. The field is now attracting more and more people with very diverse expertise (biologists, physicists, mathematician, statisticians, data scientists). It is also ripe for technology transfer and production through creation of start-ups. Consequently the huge amount of data produced in modern laboratories requires extensive numerical analysis and modelling to be correctly analysed and knowledge of physical principles to be interpreted and applied. The International Nucleome Consortium will establish a worldwide community of cooperation among multi-disciplinary nucleome scientists to accelerate scientific breakthroughs leading to new concepts, innovative interdisciplinary approaches and realistic applications for health, agriculture and industry. The consortium aims at maintaining Europe’s leading position in this quickly developing and exciting field.

Runtime: 2019 - 2023

Main proposer: Prof. Marc A. MARTI-RENOM

MC Vice-Chair: Prof. Ana POMBO

### [European Cholangiocarcinoma Network – CA18122](https://www.cost.eu/actions/CA18122/#tabs|Name:overview)

Cholangiocarcinomas (CCAs) are a heterogeneous group of cancers of the biliary tree. CCA is considered one of the deadliest cancers and its incidence is increasing constantly and dramatically in Europe. Notably, CCA is the most frequent cause of cancer metastases of unknow origin, suggesting underestimation of the CCA problem. CCA heterogeneity has limited the discovery of biomarkers and novel therapeutic options, hampering the development of tools for early diagnosis and effective treatment. CCA constitutes a major challenge for researchers, clinicians, national health systems and society. Still, coordinated multidisciplinary pan-European studies are lacking. As such, the EURO-CHOLANGIO-NET (European Cholangiocarcinoma Network) aims to set up a pan-European-wide interdisciplinary co-operative network of stakeholders, including scientists, clinicians, regulatory authorities, small/medium enterprises (SMEs) and industry partners, to address the CCA problem. Through the creation of shared data registries inherent main relevant basic or clinic-epidemiologic aspects, conference calls, meetings, workshops, Short-Term Scientific Missions as well as training schools, this Action will coordinate efforts aiming at advancing the understanding of CCA to translate basic research and preclinical findings into clinical practice. For this purpose, this Action will be organized in 7 Working Groups (WGs) dealing with interrelated aspects of CCA: Preclinical, In-Depth Histomorphological Phenotyping, Molecular Profiling, Epidemiology, Clinical Characterization and Trials, Early Diagnostic Biomarkers, Development of Novel Therapeutic Targets and Tools, Legislation and Ethics. These WGs will work to construct efficient connections, exchanges and promote capacity-building objectives (i.e. data registries, young researchers mobility, meetings, seminars, consensus guidelines and more).

Runtime: 2019 - 2023

MC Chair: Dr Vincenzo CARDINALE

MC Vice-Chair: Dr Jésus BANALES

### [European network for Gynaecological Rare Cancer research: From Concept to Cure – CA18117](https://www.cost.eu/actions/CA18117/#tabs|Name:overview)

Approximately 18.5 million women annually are affected by gynaecological cancer, from which approximately 50% are classified as rare cancers. Delayed diagnosis of patients suffering from rare gynaecological cancers leads to poor outcomes and contributes to a huge socio-economic burden. This field is lagging due to distinct scientific and technological challenges that gynaecological cancer research faces. Currently, the overall efforts for addressing these challenges are fragmented across different European countries (and beyond).

GYNOCARE aims to address these challenges by creating a unique network between key stakeholders covering five distinct domains (from concept to cure): basic research on rare gynaecological cancer, biobanking, industrial dimension, legal and regulatory requirements for international trials and other research collaborative efforts, and high-quality, international, and innovative clinical trials. To achieve our ambitious goals, we have devised research coordination and capacity building objectives in accordance with mission and vision of the COST Action.

GYNOCARE will focus on (1) capacity-building on rare gynaecological cancer by connecting high-quality scientific communities in various disciplines, existing networks, policy-makers, industrial partners, and patient organisations across Europe and beyond; (2) coordinating, and contributing to the development of a research roadmap dedicated to connect (innovative) basic research to (harmonised) biobanking to ‘smarter’ clinical trials; (3) the development of a platform for sharing best practices, including funding roadmap and legal/ethical requirements, in gynaecological cancers – aiming to advice policy-makers and other key stakeholders; and (4) providing (equal) networking opportunities for early-stage researchers, and other talented young professionals.

Runtime: 2019 - 2023

MC Chair: Dr Sandro PIGNATA

MC Vice-Chair: Dr Antonio GONZALEZ MARTIN

### [Cancer nanomedicine - from the bench to the bedside – CA17140](https://www.cost.eu/actions/CA17140/#tabs|Name:overview)

Finding efficient cancer therapies is an urgent and still unresolved problem and, in the fight against this disease, scientists are devoting tremendous efforts towards the utilization of nanomedicines. Nanotherapeutics exhibit major benefits with respect to unmodified drugs, including improved half-life, more efficient tumour targeting, and reduced side effects. However, only a few nanotherapeutics have reached the commercial level, most still being in the investigational phase. Accordingly, this Action aims at developing and strengthening industry-academia relations with an ultimate goal: fostering the clinical translation of nanomedicine from bench to bedside. This will be achieved by creating the first, pan-European interdisciplinary network of representatives from academic institutions and small and medium enterprises including clinical research organizations (CROs) devoted to the development of nanosystems carrying anticancer drugs from their initial design, pre-clinical testing of efficacy, pharmacokinetics and toxicity to the preparation of detailed protocols needed for the first phase of their clinical studies. By promoting scientific exchanges, technological implementation and innovative solutions, the Action will provide a timely instrument to rationalize and focus research efforts at the EU level in dealing with the grand challenge of nanomedicine translation in cancer, one of the major and societal-burdening human pathologies. By virtue of its quality, the Action network will also generate research core teams of excellence for funding applications, patent filling and discovery of major scientific impact. The network will also be actively devoted to raising awareness on the high potential on nanomedicine through publications in international peer-reviewed journals, and presentations at open events.

Runtime: 2018 - 2022

MC Chair: Prof. Barbara KLAJNERT-MACULEWICZ

MC Vice-Chair: Prof. Sabrina PRICL

### [Towards understanding and modelling intense electronic excitation – CA17126](https://www.cost.eu/actions/CA17126/#tabs|Name:overview)

Electronic excitation reaching high energy density is central in many different applications, from materials processing to medical treatments. It emerges when intense radiation arising from sources such as lasers, swift ions, or high-flux X-ray or electron pulses, interact with matter. In general, only partial aspects related to the excitation produced by this type of sources are treated. The lack of a systematic methodology to face the simulation of the underlying phenomena makes it essential to involve scientists from different fields, theoreticians, simulators, and experimentalists. A successful methodology will require smart strategies to make existing solutions, which are appropriate within restricted scopes, work together within a multiscale formalism. The proposed COST Action will tackle this challenge through the following approach

1.Identify and propose experiments to validate simulations as an optimal way to generate progress in the field of intense electronic excitation.

2. Identify the specific role of different radiation sources on electronic excitation-induced effects. This will allow us to connect distinct communities that explore similar effects in parallel.

3. Identify strategies to connect computational methods on different timescales. This will be a central point of the project, since most methods operate reasonably well within their scope of applicability but their coupling to other approaches is not straightforward.

4. Transfer the newly acquired knowledge to industry and societal applications by taking advantage of COST networking tools.

This Action aims at creating a network of research groups with expertise in the different parts of the challenge tackled and a common research objective.

Runtime: 2018 - 2022

MC Chair: Prof. Antonio RIVERA

MC Vice-Chair: Prof. Jorge KOHANOFF

### [Identifying Biomarkers Through Translational Research for Prevention and Stratification of Colorectal Cancer – CA17118](https://www.cost.eu/actions/CA17118/" \l "tabs|Name:overview)

This Action aims at using innovative translational research to identify colorectal cancer biomarkers for personalized medicine that will improve screening, early detection and disease follow-up, and attain better tumour profiling, state-of-the-art functional characterization of genetic variants and new therapy approaches. It will be organized in the following working groups:

* *Disease risk profiling applied to the optimization of current screening programs*. Germline predisposition variants, environmental factors, epigenetics, microbiome and metabolomics biomarkers will be used to better select patients eligible to be screened.
* *Non-invasive biomarkers for early detection and disease follow-up*. Circulating tumour cells, circulating tumour nucleic acids, tumour-educated platelets and exosomes will be explored in order to identify new tools for early detection and monitoring of the disease.
* *Tumour profiling to identify biomarkers with prognostics and predictive value for patient stratification*. Intra-tumour heterogeneity will be considered and tumour mutational profiling, epigenetics, single-cell genomics sequencing used as instruments to better inform tumour and precursor lesion characterization.
* *Functional genomics and new therapies*. Candidate genetic variants will be validated and routes to novel therapies for this disease will be conceived. To do so, cutting-edge approaches such as CRISPR-Cas9 and immunotherapy will be applied.

The network will bring together participants from different COST countries and will facilitate the research interaction and collaboration between research groups and enterprises interested in the described objectives. Diverse expertise includes clinical practice, germline and somatic genetics, epigenetics, bioinformatics, cell and molecular biology, microbiology, immunology, biostatistics, epidemiology, health economy and the industrial sector.

Runtime: 2018 - 2022

MC Chair: Dr Sergi CASTELLVI-BEL

MC Vice-Chair: Dr Richarda DE VOER

### [International Network for Translating Research on Perinatal Derivatives into Therapeutic Approaches – CA17116](https://www.cost.eu/actions/CA17116/#tabs|Name:overview)

Stem cells hold great promise in the evolving field of regenerative medicine, and there are many sources from which they can be obtained. Over the past decade different perinatal (Pn) tissues have been shown to harbor a vast array of stem cells with therapeutic potential. This relatively new field of research is rapidly expanding, and its relevance is supported by the recent emergence of clinical trials in Europe and worldwide.

There are, however, many issues that need to be addressed to ensure optimal research outcome and clinical experimentation data interpretation. These issues range from the need to arrive to a consensus on nomenclature and optimal techniques for isolation, characterization, and cryopreservation, to more advanced issues such as collating data and expertise towards an understanding and exploitation of the mechanisms and therapeutic actions of perinatal derivatives. There is also the necessity to identify gaps in knowledge and how collaborative research can address them.

Therefore, this COST Action will unite a currently fragmented a critical mass of academic, clinical, and industry expertise to enhance both basic understanding and translational potential of perinatal derivatives.

The Action will develop a platform for the exchange of concepts, methods, and training of young researchers.

Runtime: 2018 - 2022

MC Chair: Prof. Ornella PAROLINI

MC Vice-Chair: Prof. Peter PONSAERTS

### [European network for advancing Electromagnetic hyperthermic medical technologies – CA17115](https://www.cost.eu/actions/CA17115/#tabs|Name:overview)

Electromagnetic (EM) hyperthermic technologies hold great potential in the treatment of diseases, especially for cancers that are resistant to standard regimens. These technologies modify tissue temperature: hyperthermia heats the diseased tissue to make it susceptible to treatments, and ablation heats the tissue until it is destroyed. Hyperthermia is particularly effective in treatment of cervical and breast cancer, head and neck cancers, sarcoma in adults, and germ cell tumours in children; while radiofrequency and microwave ablation offer promise for treating liver, kidney, and lung cancers.

Overall, these techniques have shown significant potential and there is substantial opportunity to solidify their use clinically and to apply them to a wider range of medical conditions. However, underpinning the development of these techniques is the need for accurate knowledge of the dielectric and thermal properties of tissues, which provide the foundation for these technologies and de-risk the technical challenge before commercialization. Furthermore, contributing to the stagnant market of EM hyperthermic medical devices is the fact that, often researchers working on the development of medical technologies are not fully aware of, and not trained to address, the clinical and commercialisation challenges facing novel medical devices.

To address these challenges, the MyWAVE Action takes a holistic approach by bringing together key players in the field of dielectric spectroscopy, translational research, and medical professionals. Conjoining these varied communities into one collaborative network is critical to advance the design, development, and commercialisation of EM hyperthermic technologies, so that they can reach patients faster and improve treatment outcomes.

Runtime: 2018 - 2022

MC Chair: Dr Lourdes FARRUGIA

MC Vice-Chair: Dr Emily PORTER

### [New diagnostic and therapeutic tools against multidrug resistant tumours – CA17104](https://www.cost.eu/actions/CA17104/#tabs|Name:overview)

This Action will build the first multidisciplinary network, including academic laboratories, research institutes, small and medium enterprises (SMEs), with a wide range of excellent and non overlapping expertise, aiming at improving at the same time the diagnosis and therapy of multidrug resistant (MDR) solid tumours.

Until now, there is only fragmented knowledge on biomarkers and therapeutic tools used against MDR tumours; there are not algorithms predictive/diagnostic of MDR tumours ex-ante; all the past therapies against MDR tumours failed. The key challenge of this Action is to fill these gaps, by producing a comprehensive, open and user-friendly platform of knowledge on MDR tumours, identifying new diagnostic/predictive biomarkers, producing new and safe compounds applicable to personalized treatments of MDR tumours.

Up to 70% of solid tumours are resistant at the diagnosis: this means poor life quality and poor prognosis for patients, high management costs for the European healthcare systems. This Action is working to improve diagnosis and treatment of patients with MDR tumours and to reduce the costs for their management.

Second, by creating fruitful collaborations between basic and industrial research, we will give impulse to the creation of new Start-up and SMEs in Europe.

Finally, the Action aims at raising the level of European research on MDR, reducing the disparity in the research quality between EU countries and ITC, providing the necessary training for European Early Career Investigator (ECI) to grow as future independent research leaders, regardless of location, age or gender.

Runtime: 2018 - 2022

MC Chair: Prof. Roberta FRUTTERO

MC Vice-Chair: Dr Javier DE LAS RIVAS

### [Delivery of Antisense RNA Therapeutics – CA17103](https://www.cost.eu/actions/CA17103/#tabs|Name:overview)

Antisense oligonucleotides (ASOs) are a new class of drugs that, through very specific targeting, could correct genetic defects for rare inherited diseases, modulate autoimmune or neurodegenerative diseases or target tumors or viruses. However, only a few of such drugs are currently in the market and they have been less effective as expected. The main hurdle for their efficacy seems to be their deficient delivery to target tissues but, while translational research on ASO is surging, very little is known about the mechanisms by which ASOs are taken up by different tissues and specific cells.

Regarding delivery, the ASO field is fragmented, with researchers in academia and industry working in isolation on specific diseases, generally focusing on therapeutic effects in target tissues. The main aim of the Delivery of Antisense RNA ThERapeutics (DARTER) Action is to use networking and capacity building in the field of nucleic acid therapy delivery to allow RNA-targeting nucleic acid drugs to reach their full potential and become a mainstream therapeutic option.

DARTER will act through 3 Working Groups with research objectives (delivery strategies, model systems, safety and toxicology) and one capacity building group (stakeholder communication) with the objective of achieving consensus on protocols and assessment of ASO delivery and toxicology and training new researchers within a cooperative research framework. DARTER COST network will contain participants from COST countries and several international partners, including academics, industrial partners, patient representatives and clinicians and it is open to other interested stakeholders.

Runtime: 2018 - 2022

MC Chair: Dr Virginia ARECHAVALA-GOMEZA

MC Vice-Chair: Prof. Annemieke AARTSMA-RUS

### [European Network on Pseudomyxoma Peritonei – CA17101](https://www.cost.eu/actions/CA17101/#tabs|Name:overview)

Pseudomyxoma peritonei (PMP) is a rare abdominal cancer originating in the appendix, causing extensive tumour growth in the peritoneal cavity. Although rare, PMP still dramatically affects the lives of almost 4,000 new persons in Europe every year, posing a huge financial and logistical challenge for health-care providers. If complete surgical removal cannot be accomplished at expert centres, prognosis is very poor, and no other effective treatments are currently available.

Because it is a rare disease, research into the pathogenesis, classification, molecular composition and treatment of PMP has been fragmented and challenging. The EuroPMP Action aims to sculpt a new, collaborative landscape within PMP research through the creation of a strong and capable network of experts from many fields, including surgeons, pathologists, oncologists, radiologists, molecular biologists, bioinformaticians and allied health care professionals. The Action will work towards a cure for PMP through the facilitation of collaborative research projects, the sharing and dissemination of knowledge, and the improvement of standards of care for the thousands of patients afflicted with PMP.

Runtime: 2018 - 2022

MC Chair: Prof. Kjersti FLATMARK

MC Vice-Chair: Dr Faheez MOHAMED

### [European Network of Vaccine Adjuvants – CA16231](https://www.cost.eu/actions/CA16231/#tabs|Name:overview)

This Action aims to bring together experts and stakeholders from the three main areas of vaccine research: human infectious disease, cancer, and animal disease in order to address one of the most critical steps in vaccine development: the use of adjuvants in vaccine formulations. The ultimate goal is to establish a platform to discuss, share and synergize available knowledge on adjuvants and vaccine formulation, and to coordinate their translation into successful, safe and innovative vaccines. Significant effort will be placed on bridging these three separated vaccine fields. This network will significantly strengthen ongoing EU-funded activities and provide a platform for accelerating the development of affordable and effective vaccines in Europe. In addition, as well as sharing their experiences with each other, the Action participants will also engage the general public, providing impartial, balanced and scientific information on adjuvants and vaccines. This Action will contribute to the strengthening of Europe’s position as a global leader in vaccinology, and will increase knowledge across the currently separated fields of vaccine development, as well as providing a repository of information for the European public about vaccines and vaccination.

Runtime: 2017 - 2021

MC Chair: Dr Maria LAWRENZ

MC Vice Chair: Dr Dennis CHRISTENSEN

### [LEukaemia GENe Discovery by data sharing, mining and collaboration – CA16223](https://www.cost.eu/actions/CA16223/#tabs|Name:overview)

Childhood acute lymphoblastic leukaemia and lymphoma account for ~30% of all childhood cancers, but the causes remain largely unknown. Recently, both low and high impact genetic risk factors for familial and non-familial childhood leukaemia/lymphoma have been identified. Studying patients with distinct rare genetic predisposition to leukaemia/lymphoma is crucial, because the underlying biologic mechanisms are likely to be relevant for leukaemogenesis and lymphomagenesis in general. Depending on the mutated pathways in patients with genetic predisposition, patients may need an adapted treatment strategy because of poor treatment response and/or increased risk of severe toxicities. Moreover, knowledge of genetic predisposition is of interest for relatives at risk. To learn as much as possible from and for these patients, international collaboration between leukaemia and lymphoma experts is crucial. Accordingly, this Action consisting of paediatric oncologists, geneticists, and scientists from multiple countries in- and outside Europe will meet on a regular basis to exchange research strategies and to establish joint research projects and therapeutic activities addressing patients with leukaemia/lymphoma predisposition. Due to improving and less costly genome and epigenome mapping technologies, the field is rapidly changing, and we foresee that through the proposed collaboration we can strengthen our expertise in the areas of leukaemia/lymphoma aetiology, biology, epidemiology, treatment, toxicity risk management, counselling, and psychological impact in a highly significant manner. This international application is a first step in order to promote these broad and critical activities that will be crucial for childhood leukaemia/lymphoma research and improved health care.

Runtime: 2017 - 2021

MC Chair: Dr Esme WAANDERS

MC Vice Chair: Prof. Christian KRATZ

### [Network on the Coordination and Harmonisation of European Occupational Cohorts” (OMEGA-NET) – CA16216](https://www.cost.eu/actions/CA16216/#tabs|Name:overview)

Occupation and paid employment are an essential component of adult life and a major determinant of health and healthy ageing. However, in recent years there has been very limited coordination and promotion of European health research on occupation and employment. Europe currently has some of the most valuable occupational, industrial, and population cohorts worldwide. The lack of integration of these cohorts hampers the optimal exploitation of these resources, essential to underpin evidence-based interventions and policy. The overarching concept of the Network on the Coordination and Harmonization of European Occupational Cohorts (OMEGA-NET) is to create a network to optimize the use of occupational, industrial, and population cohorts at the European level. OMEGA-NET will advance i) collaboration of existing cohorts, with extensive contemporary information on employment and occupational exposures, ii) coordination and harmonization of occupational exposure assessment efforts, and iii) facilitation of an integrated research strategy for occupational health in Europe. We will inventory numerous cohorts with occupational information in Europe; implement an online interactive tool with detailed information on existing cohorts; facilitate work on harmonization of occupational exposure and health outcome information and new protocols for data collection; connect scientific communities on occupational health in Europe and beyond; and provide networking, leadership, and training opportunities for early career researchers in occupational epidemiology and exposure assessment. The work will provide a foundation for an enhanced evidence base for the identification of health risks and gains related to occupation and employment to foster safe and healthy preventive strategies and policies.

Runtime: 2017 - 2021

MC Chair: Dr Ingrid Sivesind MEHLUM

MC Vice Chair: Dr Michelle TURNER

### [Brillouin Light Scattering Microspectroscopy for Biological and Biomedical Research and Applications – CA16124](https://www.cost.eu/actions/CA16124/#tabs|Name:overview)

This BioBrillouin Action will establish a collaborative network of European researchers and instrument developers working in the field of Brillouin Light Scattering Spectroscopy (BLSS) applied to life sciences and health related problems. BLSS uses visible or infrared light from a laser source to probe the mechanics of a material through light scattering from thermally induced acoustic modes. It can give access to the viscoelasticity and structure of matter in a non-destructive contactless way, and when coupled to optical (confocal) microscopy, has proven to be particularly well suited for biomedical applications. Though an established tool in condensed matter physics, only more recently has BLSS seen promising applications in the life sciences and medical diagnostics. This can largely be attributed to advances in instrument (spectrometer) design coupled with increasing interest in the biomechanics of cells and tissues and their relation to disease, underlying genetics and biochemistry. There are now a significant and increasing number of researchers actively working in BLSS for biomedical research in Europe. It is the aim of the BioBrillouin Action to for the first time bring together the diverse community working in the field, which includes instrument developers, physicists, chemists, biologists and clinicians, with the core aim of stimulating collaboration, promoting technological advancement and paving the way towards routine life science research and clinical applications of BLSS.

Runtime: 2017 - 2021

MC Chair: Dr Kareem ELSAYAD

MC Vice Chair: Prof. Francesca PALOMBO

### [European Epitranscriptomics Network – CA16120](https://www.cost.eu/actions/CA16120/#tabs|Name:overview)

The proposed COST Action aims at fostering the development of the emerging field of epitranscriptomics in Europe. We believe that, by understanding the role of RNA modifications in physiology and pathology, novel and powerful disease biomarkers and drug targets could be identified. This will in turn lead to the development of a whole new class of diagnostic tools and targeted therapies, with particular attention devoted to cancer treatment. Furthermore, mechanistic understanding of this set of phenomena will allow to deepen our understanding of the contribution of post-transcriptional regulation of gene expression to proteome and thus phenotype variation.

By implementing collaborative efforts, data sharing and mobility-based learning opportunities, this COST action will accelerate discovery in the epitranscriptomics field and contribute to the ultimate realization of this vision. Tightly integrating biotech companies in this networking initiatives will be key to the complete achievement of the action goals and a considerable added value for the European biomedical sector, potentially offering a competitive advantage in the ensuing market.

Runtime: 2017 - 2021

MC Chair: Prof. Alessandro QUATTRONE

MC Vice Chair: Dr Mary O'CONNELL

### [In vitro 3-D total cell guidance and fitness – CA16119](https://www.cost.eu/actions/CA16119/#tabs|Name:overview)

The present Action is aimed at refining our understanding of the in vivo microenvironment, reducing the differences when translating it in vitro, to create 3D total guidance ex vivo culture systems for the replacement of animal use.

Traditional in vitro 2D culture systems fail to imitate the physiological and biochemical features of cells in the original tissue. Differences between the microenvironment provided by cell culture models and that distinct of the in vivo tissues are significant and can cause deviations in cell response and behaviour.

In this COST Action, the present understanding of in vivo micro/macro-environment will be refined in order to reproduce in vitro the physiological system in the best possible way: surface topography, substrate stiffness, mechanical stimulation, chemical cues and localised density will be analysed. This will allow to develop reliable “3D total guidance” in vitro models reducing the number of animals used and allowing a safe translation of the present basic knowledge in cell repair and regeneration from the laboratory bench to the clinical application, with a positive impact on every day’s life patients and general Health costs.

Researches in this field are being performed by different groups in the EU, but efforts need to be coordinated in order to avoid duplication, set targets and guidance for future research and to standardise protocols through a large interdisciplinary collaborative EU network. These goals can only be achieved under a COST programme.

Runtime: 2017 - 2021

MC Chair: Prof. Tiziana BREVINI

MC Vice-Chair: Prof. Alireza FAZELI

### [CliniMARK: ‘good biomarker practice’ to increase the number of clinically validated biomarkers – CA16113](https://www.cost.eu/actions/CA16113/#tabs|Name:overview)

Thousands of circulating proteins have been shown to be hallmarks of emerging disease, response to treatment, or a patients’ prognosis. The identification of these small molecule biomarkers holds a great promise for significant improvement of personalized medicine based on simple blood tests. For instance, diagnosis and prognosis with biomarkers (e.g.  carcinoembryonic antigen (CEA)) has significantly improved patient survival and decreased healthcare costs in colorectal cancer patients. Unfortunately, despite significant investments to increase the number of biomarker studies, only ~150 out of thousands of identified biomarkers have currently been implemented in clinical practice. This is mainly caused by the time-consuming process of reliably detecting biomarkers, the irreproducibility of studies that determine a biomarkers’ clinical value, and by a mismatch in studies that are performed by academia and what is required for regulatory and market approval. To increase the number of clinically validated biomarkers, rather than further increasing the number of biomarker discovery studies, CliniMARK will improve the quality and reproducibility of studies and establish a coherent biomarker development pipeline from discovery to market introduction.

CliniMARK aims to achieve said goal by creating a Best Biomarker Practice (BBP) community,which will provide guidance to:

1. Classify biomarkers according to their characteristics, anticipated clinical use, and their phase of development,
2. Select and validate appropriate research-grade biomarker detection tests,
3. Select appropriately designed studies and biological samples to reliably and reproducibly validate biomarkers clinically, and
4. Select and report on appropriate clinical data storage, biomarker data storage, data analysis protocols, privacy concerns, ethical issues, and statistical analysis methods.

Runtime: 2017 - 2021

MC Chair: Dr Theo M. LUIDER

MC Vice Chair: Dr Antonia VLAHOU

### [Gene Regulation Ensemble Effort for the Knowledge Commons – CA15205](https://www.cost.eu/actions/CA15205/#tabs|Name:overview)

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

Runtime: 2016 - 2020

MC Chair: Prof. Martin KUIPER

MC Vice-Chair: Dr Maria GAZOULI

### [Multi-target paradigm for innovative ligand identification in the drug discovery process (MuTaLig) – CA15135](https://www.cost.eu/actions/CA15135#tabs|Name:overview)

The aim of this COST Action is to join highly-qualified research teams working in disciplines around the field of medicinal chemistry, into a novel network devoted to the multi-target issue in drug discovery. The choice of this theme is related to its marked multidisciplinary character, which can ensure a strong interaction among all COST Action participants. Currently, an important and emerging issue in modern drug discovery is to design novel or identify existing bioactive compounds, endowed with the capability to interact selectively with two or more macromolecular targets, exerting their effects against certain therapeutic goals in a synergic fashion. This leading concept stimulated this COST Action focusing on novel ligands able to recognize selected multiple targets, to promote closer scientific links among European research groups involved in medicinal chemistry field at both academic and industrial level. The research competencies of the network will span around medicinal chemistry, from synthetic chemistry, natural products and biophysics to theoretical chemistry, molecular modelling and biological screening.

Runtime: 2016 - 2020

MC Chair: Prof. Stefano ALCARO

MC Vice-Chair: Prof. Fernanda BORGES

### [The comet assay as a human biomonitoring tool (hCOMET) – CA15132](https://www.cost.eu/actions/CA15132/#tabs|Name:overview)

Many human biomonitoring studies have used the comet assay to measure DNA damage (some also measuring DNA repair). In most cases, the assay is applied to peripheral blood mononuclear cells. Results from relatively small individual studies are often inconsistent, and it is advantageous to carry out a pooled analysis of the combined data from all available studies. hCOMET will be a network comprising researchers who are active (or intend to be active) in human biomonitoring with this assay. Results supplied by these researchers will be compiled as a single database representing an estimated 19,000 individual DNA damage measurements. The pooled analysis will allow us to determine which factors (smoking, age, nutrition, sex, occupational exposure etc.) affect DNA damage, and to what extent. Fewer studies have included DNA repair capacity as an endpoint; we will collect what data we can and carry out a detailed review (or a pooled analysis if enough data). In addition, hCOMET will address the issue of inter-laboratory reproducibility of the assay by devising standard protocols, for both DNA damage and DNA repair measurement, coordinating ring studies to test these protocols, and offering training courses and exchanges, so that in future comparison of results from different studies will be facilitated. We will review applications of the assay to other human cell types and isolation methods (such as leukocytes obtained from frozen blood).

Runtime: 2016 - 2020

MC Chair: Prof. Andrew COLLINS

MC Vice-Chair: Dr Gudrun KOPPEN

### [Diagnosis, Monitoring and Prevention of Exposure-Related Noncommunicable Diseases (DiMoPEx) – CA15129](https://www.cost.eu/actions/CA15129/#tabs|Name:overview)

Studying adverse health outcomes related to the environmental exposures (in the living and working environment) is a major societal challenge today. According to estimates made by the WHO, worldwide about 55 million people died in 2011 from non-communicable diseases (NCDs), including cancer, diabetes, chronic cardiovascular, neurological and lung diseases. Although epidemiological and toxicological studies provide evidence for a significant role of environmental exposure in initiation and progression of degenerative diseases and cancer, there is still the challenge of identifying determinants of prevalence and morbidity of NCDs. After spending much time and resources to identify the contribution of genetic factors in the onset of NCDs, it is time to look closer at the evidence for a role of environment factors in the prevalence and morbidity of NCDs, DiMoPEx will develop an interdisciplinary collaborative network, providing insight into emerging issues of morbidity and mortality from exposure-related health outcomes. The action will offer interdisciplinary opportunities for cooperation between scientists and physicians/clinicians. In addition, DiMoPEx aims to attract the interest of next generation early career investigators to the emerging issues of exposure-related disease burden and various aspects of exposure sciences. DiMoPEx will foster the capacity building in Europe from the bottom up to advance ongoing long-term studies and to promote new research projects in this field. DiMoPEx will meet current public health challenges in joint research and training to understand the health-environment interactions in NCD aetiology. The action will contribute to the development of successful preventive strategies in European countries.

Runtime: 2016 - 2020

MC Chair: Prof. Lygia Therese BUDNIK

MC Vice-Chair: Dr Ludwine CASTELEYN

### [Open Multiscale Systems Medicine (OpenMultiMed) – CA15120](https://www.cost.eu/actions/CA15120/#tabs|Name:overview)

Multiscale systems medicine assumes that the growing amounts of highly diverse (multiscale) data relevant to human health and disease are the key to address current and future medical challenges. Transforming these data into effective and economical medical solutions requires appropriate means for multiscale data modelling, integration and analysis. The overarching aim of the **Open Multiscale Systems Medicine** (OpenMultiMed) COST Action is to gather a critical mass of international researchers and coordinate them as a team that develops and evaluates a transdisciplinary framework for multiscale systems medicine, consisting of novel concepts, methodologies and technologies. The unique concept and ambition of the OpenMultiMed Action rests on three pillars: (1) A **transdisciplinary** strategy in which medical researchers, mathematical modellers, data scientist, and computer scientists work jointly using a shared conceptual framework and combined disciplinary-specific approaches. (2) A strong focus on **multiscaleness** across systems medicine, multiscale modelling, multiscale data science and multiscale computing. (3) An **open-science** approach, making scientific research, data and dissemination in multiscale systems medicine accessible to all levels of an inquiring European and international society. The potential impacts resulting from the OpenMultiMed Action include more effective and economical ways of health promotion, disease prevention and therapy; more effective and efficient concepts, methods and tools for multiscale systems and data modelling, and multiscale computing; and a strengthening of scientific excellence and industrial competitiveness of individuals and organizations in medical, analytical and technological areas.

Runtime: 2016 - 2020

MC Chair: Prof. Harald SCHMIDT

MC Vice-Chair: Dr Ivan CHORBEV

### [Challenging organic syntheses inspired by nature - from natural products chemistry to drug discovery – CM1407](https://www.cost.eu/actions/CM1407/#tabs|Name:overview)

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 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 Action further aims to promote the translation between fundamental academic research and industrial drug discovery by means of NP chemistry.

Runtime: 2015 - 2019

MC Chair: Prof. Bruno BOTTA

MC Vice-Chair: Prof. Sandra LIEKENS

### [Epigenetic Chemical Biology (EPICHEM) – CM1406](https://www.cost.eu/actions/CM1406/#tabs|Name:overview)

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.

Runtime: 2015 - 2019

MC Chair: Prof. A GANESAN

MC Vice-Chair: Prof. Marianne ROTS

### [Ion Channels and Immune Response toward a global understanding of immune cell physiology and for new therapeutic approaches (IONCHAN-IMMUNRESPON) – BM1406](https://www.cost.eu/actions/BM1406/#tabs|Name:overview)

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 provide a powerful approach for dissecting the functional cell biology of the immune system.

The Action therefore will strengthen academic research in Immunology within Europe and foster closer collaborations with drug and diagnostics development programs in industry.

Runtime: 2015 - 2019

MC Chair: Dr Florence VELGE-ROUSSEL

MC Vice-Chair: Dr Pablo PELEGRIN

### [Non-globular proteins - from sequence to structure, function and application in molecular physiopathology (NGP-NET) – BM1405](https://www.cost.eu/actions/BM1405/#tabs|Name:overview)

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 Action 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.

Runtime: 2015 - 2019

MC Chair: Prof. Silvio TOSATTO

MC Vice-Chair: Prof. Kristina DJINOVIC-CARUGO

### [European Network of Investigators Triggering Exploratory Research on Myeloid Regulatory Cells (Mye-EUNITER) – BM1404](https://www.cost.eu/actions/BM1404/#tabs|Name:overview)

In cancer, infection and inflammation, the immune system’s function can be dysregulated, contributing to disease pathology. As part of this process, instead of fighting disease, immune cells may suppress beneficial immune responses and increase pathology. Despite their pathophysiological importance, the identity and biology of the so called myeloid regulatory cells (MRCs) is poorly understood. Depending on the MRC subtype and the respective disease, conflicting results have been published. This Action will form a network of researchers and clinicians which aims to establish a gold standard of common protocols and harmonizing guidelines for the analysis and clinical monitoring of MRCs. There is also a deficit in the translation of findings from animal models to humans, and Mye-EUNITER will build an analytical mouse-monkey-man correlation line. Standardized and validated tools for MRC analysis will aid the development of cellular biomarkers of disease and guide the design of novel therapies to manipulate the functions of MRCs.

Runtime: 2014 - 2018

MC Chair: Prof. Sven BRANDAU

MC Vice-Chair: Dr Annabel VALLEDOR

### [Development of a European network for preclinical testing of interventions in mouse models of age and age-related diseases (MouseAGE) – BM1402](https://www.cost.eu/actions/BM1402/#tabs|Name:overview)

The number of people over 65 is predicted to double in the next 50 years. Age is the most important risk factor for stroke, heart attacks, cancers, diabetes, and many other chronic diseases. Tackling the effects of the ageing population in Europe has stimulated funding of research initiatives at both national and European levels. A key requisite to develop new interventions for age-related conditions and promote healthier ageing is the availability and use of preclinical murine models. There is currently a clear lack of such models and appropriate standardised methodologies to test interventions. Therefore, to improve the quality of European ageing research a coordinated interdisciplinary action is needed to standardise methodologies and animal welfare, and to define endpoints, as well as centralising information, models and technologies for the assessment of interventions. This Action proposes to set-up a highly interactive and flexible European network, which will create a critical mass of cross-disciplinary scientists, clinicians and industrial partners to reach consensus on ways to test preclinical interventions in ageing mice. It will consolidate current best practice across leading European institutions and researchers, maximise resource efficiency, and provide a platform to help train the next generation of scientists.

Runtime: 2014 - 2018

MC Chair: Prof. Ilaria BELLANTUONO

MC Vice-Chair: Prof. Ralph MÜLLER

### [Multifunctional Nanoparticles for Magnetic Hyperthermia and Indirect Radiation Therapy (Radiomag) – TD1402](https://www.cost.eu/actions/TD1402/#tabs|Name:overview)

The Action aims to bring together and to organise the research outcomes from the different participating network members in a practical way to provide clinicians with the necessary input to trial a novel anti-cancer treatment combining magnetic hyperthermia and radiotherapy, also identifying future research objectives upon appraisal of the obtained results. Feedback between the different working groups here is essential and is expected that the lifetime of this Action proposal will eventually result in a compendium of best practices for magnetic hyperthermia. RADIOMAG will generate new and strengthen the existing synergies between technical advances (thermal imaging / MH), new treatment concepts (combined targeting radiosensitisation and magnetic thermotherapy) and biocompatible coating in order to achieve a breakthrough in the clinical application of magnetic hyperthermia. Due to the complexity of this aim, synergies can only be achieved on a longer time frame, by means of workshops, STSMs, joint publications, common Horizon 2020 research proposals and exchange with other COST Actions (e.g. TD1004, TD1205).

Runtime: 2014 - 2018

MC Chair: Dr Simo SPASSOV

MC Vice-Chair: Dr Daniel ORTEGA

### [Raman-based applications for clinical diagnostics (Raman4clinics) – BM1401](https://www.cost.eu/actions/BM1401/#tabs|Name:overview)

The aim of the Action is to develop a collaborative network of top European experts working towards the progress of the emerging field of Raman-based applications for clinical diagnostics. The Actioncoordinates research run by diverse yet complementary research groups in Europe on novel, label-free and rapid technologies based on a wide variety of Raman spectroscopies for the clinical diagnostics of body fluids, bacteria, cells and tissues. International interdisciplinary networking opportunities are offered between scientists within biophotonics, chemometricians and physicians/clinicians. Main goal of the network is to give a major impetus in this vibrant field of research by aligning it to clinical requirements and application aspects (the unmet medical need) by means of COST as the best mechanism to progress the state-of-the-art. The Action will create a platform for scientific communication, exchange, collaboration and for new research activities, combining the partners’ expertise in technology, component, system and methodology development and medical application. As a result, novel technology portfolios for clinical diagnostics will emerge to the benefit of patients as well as to the economy. The interest of the next generation of promising scientists will be attracted, thereby ensuring that Europe will remain at the frontline of research into clinical diagnostics.

Runtime: 2014 - 2018

MC Chair: Prof. Jürgen POPP

MC Vice-Chair: Prof. Francesco Saverio PAVONE

### [European network for innovative uses of EMFs in biomedical applications (EMF-MED) – BM1309](https://www.cost.eu/actions/BM1309/#tabs|Name:overview)

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.

Runtime: 2014 - 2018

MC Chair: Prof. Antonio ŠAROLIĆ

MC Vice-Chair: Dr Mirjana MOSER

### [European network to integrate research on intracellular proteolysis pathways in health and disease (PROTEOSTASIS) – BM1307](https://www.cost.eu/actions/BM1307/#tabs|Name:overview)

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 Action 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.

Runtime: 2014 - 2018

MC Chair: Dr Rosa BARRIO

MC Vice-Chair: Dr Olivier COUX

# **Stakeholders in the field of cancer research participating in the event**

## Stakeholders funding cancer research

The European support provided is a web with different initiatives that complement each other. COST aims to bring together representatives of these initiatives together with researchers who represent COST Actions. This section provides information about selected stakeholders which will contribute to the discussion.

### European Commission – DG RTD

|  |  |
| --- | --- |
| **C:\Users\fortelli\AppData\Local\Microsoft\Windows\INetCache\Content.Word\EU-FLAG_cmyk.bmp** | The Directorate-General for Research and Innovation defines and implements European Research and Innovation (DG RTD) policy with a view to achieving the goals of the Europe 2020 strategy and its key flagship initiative, the Innovation Union.  To do so, the DG contributes to the European Semester by analysing national R&I policies, by assessing their strengths and weaknesses, and by formulating country specific recommendations where necessary. It monitors and contributes to the realisation of the Innovation Union flagship initiative and the completion of the European Research Area. It funds excellent Research and Innovation through Framework Programmes taking a strategic programming approach. |
| **Link** | <http://ec.europa.eu/research/health/index.cfm?pg=area&areaname=cancer>  <https://cordis.europa.eu/search/result_en?q=cancer> |
| **Priorities** | The EU aims to develop improved patient-oriented strategies for combating cancer - ranging from prevention to more effective and earlier diagnosis, but also better treatment with minimal side effects. In order to achieve practical benefits and improve the quality of life of EU citizens, EU-supported research focuses on dissecting the causes and mechanisms of cancer, translating this basic knowledge into clinical applications and supporting clinical research on new and improved interventions. Other important issues related to cancer are also covered, e.g. ageing and cancer, childhood cancers, regional differences, psychosocial aspects, palliative and end-of-life care, survivorship issues and guidance to support groups. |
| **Key documents** | [Relevant projects](http://cordis.europa.eu/search/result_en?q=%28%27cancer%27%29%20AND%20%28programme/pga=%27H2020-EU.3.1.*%27%20OR%20programme/code=%27FP7-HEALTH,FP6-HEALTH,FP6-LIFESCIHEALTH%27%29) |
| **Members** | EU and Associated member countries |
| **Contact person(s)** | <http://ec.europa.eu/research/index.cfm?pg=contacts&lg=en&origin=footer> |

J[oint Programming Initiatives (JPI) – Healthy Diet for a Healthy Life (HDHL)](https://www.healthydietforhealthylife.eu/)

|  |  |
| --- | --- |
|  | A crucial element of the Joint Programming Process is the alignment of national and European research programmes and strategies with the Strategic Research Agenda established within the setting of the Joint Programming Initiatives. The goal of alignment activities is a broad implementation of the Strategic Research Agenda of JPI HDHL. A significant amount of research activities on nutrition and health is taking place at country level. Alignment of these activities will increase the impact of the individual efforts of the involved countries to contribute to solutions of the global societal challenge that JPI HDHL is addressing. |
| **Link** | https://www.healthydietforhealthylife.eu/ |
| **Priorities** | Joint programming of research in the field of nutrition, food and health will provide for coordination of research on the impact of diet and lifestyles on health, contribute significantly to the construction of a fully operational European Research Area on prevention of diet-related diseases and strengthening leadership and competitiveness on the research activities in this field. The ambitious major goals of JPI HDHL are as follows:   1. The coordination of the scope of research programmes across Europe and reducing duplication of efforts. 2. The allowance for easier to address common challenges developing suitable solutions with the same objective concerning food, nutrition and active life policy in the international arena while taking into consideration cultural diversities among countries. 3. The promotion of scientific excellence through joint activities with common funding and peer-review processes to minimise fragmentation of research activities and to use public resources more efficiently and effectively improving the accountability and transparency of public research programmes. 4. The support of cross-border collaboration and facilitation of data pooling and their collection in a uniform and standardised way. 5. The sharing expertise scattered across countries or throughout Europe as a whole promoting creation of a critical mass, cross-border mobility and training to facilitate timely dissemination and translation of research results to inform public health practice and policy. 6. The increase of the scientific, technological and innovative impacts of public investments in research by strengthening the coordination with other related policies through greater programme visibility and promotion of cross-border policy learning. |
| **Key documents** | [Joint Actions](https://www.healthydietforhealthylife.eu/index.php/joint-actions) |
| **Members** | In the framework of this Joint Programming Initiative 25 Member States and Associated Countries are engaged (<https://www.healthydietforhealthylife.eu/index.php/about/partners>). |
| **Contact person(s)** | <http://ec.europa.eu/research/index.cfm?pg=contacts&lg=en&origin=footer> |
| **Calls** | <https://www.healthydietforhealthylife.eu/index.php/open-calls> |

European Commission - Marie Skłodowska-Curie Actions

|  |  |
| --- | --- |
|  | Grants provided by Marie Skłodowska-Curie Actions are available for all stages of a researcher’s career. Fellows include PhD candidates and those carrying out more advanced research.  Because they encourage individuals to work in other countries, the MSCA make the whole world a learning environment. They encourage collaboration and sharing of ideas between different industrial sectors and research disciplines – all to the benefit of the wider European economy. MSCA also back initiatives that break down barriers between academia, industry and business. In addition, they reach out to the public with events that promote the value – and fun side – of science.  These inter-related goals are reflected in the various types of MSCA actions.  It all adds up to a huge investment. In fact, the EU has set aside EUR 6.16 billion to be spent by 2020 on researcher training and career development. |
| Relevant links | <https://ec.europa.eu/research/mariecurieactions/msca-actions_en>  [Funding opportunities: ec.europa.eu/research/mariecurieactions/actions/get-funding\_en](https://ec.europa.eu/research/mariecurieactions/actions/get-funding_en) |

European Research Council (ERC)

|  |  |
| --- | --- |
| A close up of a logo  Description automatically generated | **The ERC's mission is to encourage the highest quality research in Europe through competitive funding and to support investigator-driven frontier research across all fields, on the basis of scientific excellence.**  The ERC complements other funding activities in Europe such as those of the national research funding agencies, and is a flagship component of Horizon 2020, the European Union's Research Framework Programme for 2014 to 2020.  Being 'investigator-driven', or 'bottom-up', in nature, the ERC approach allows researchers to identify new opportunities and directions in any field of research, rather than being led by priorities set by politicians. This ensures that funds are channelled into new and promising areas of research with a greater degree of flexibility. |
| Relevant links | <https://erc.europa.eu/> |

European Institute of Innovation and Technology (EIT) Health

|  |  |
| --- | --- |
|  | **EIT Health's innovation model**  With the goal of improving healthcare in Europe, EIT Health's Innovation Platform provides comprehensive support for innovations that show the potential of rapid market penetration of innovative products and services, and the testing and implementation of novel organisational and healthcare delivery processes. EIT Health Innovation Projects focus on three specific challenges: promoting healthy living, supporting active ageing and improving healthcare.  The most promising ideas are developed into commercially viable products through a multi-disciplinary approach, involving business, medicine, IT and other fields of knowledge.  EIT Health’s Innovation Projects Portfolio consists of three types of project:   * [Innovation by Ideas](https://www.eithealth.eu/innovation-projects/by-ideas)   Innovation by ideas refers to innovation that someone has created because it has occurred to them that they can offer something useful. These are new, solution-driven ideas that the creators believe will benefit society by improving healthcare.   * [Innovation by Design](https://www.eithealth.eu/innovation-projects/by-design)   Innovation by Design refers to innovation that is meant to address an existing and usually widely known problem. Needs-driven projects that are created to address a recognised market need or societal problem, to deliver tangible results for citizens.   * [Wild Card Projects](https://www.eithealth.eu/wild-card-projects)   EIT Health Wild Card Projects are high-risk, innovative projects with transformative potential. The projects are targeted at challenges provided by EIT Health Partners, where the “solution” of the challenge would be a major breakthrough. |
| Relevant links | <https://eit.europa.eu/eit-health-model> |

ERA Healthy Diet for a Healthy Life (HDHL)

|  |  |
| --- | --- |
|  | ERA-HDHL is a proposal of ERA-NET Cofund in the field of nutrition and health to support the Joint Programme Initiative Healthy Diet for a Healthy Life (JPI HDHL). Nowadays, there is a high burden of non-communicable diseases due to unhealthy diet and lifestyle patterns. The 24 members of the JPI HDHL are working together to develop means to (1) motivate people to adopt healthier lifestyles including dietary choices and physical activity, (2) develop and produce healthy, high-quality, safe and sustainable foods and (3) prevent diet-related diseases. Between 2012 and 2015, JPI HDHL had implemented 7 JFAs with 40 M€ funds from national funding. The JPI HDHL is now set for further enhancement in tight coordination with the EC through the ERA-NET Cofund instrument. ERA-HDHL will provide a robust platform for implementing joint funding actions (JFAs) that address the needs identified in the JPI HDHL strategic research agenda and strengthen the research funding activities of JPI HDHL. An EC cofunded call on the identification and validation of biomarkers in nutrition and health will be implemented. For this foreseen action, the member countries of the JPI HDHL have doubled their financial commitment comparing to previous JFA implemented on a similar topic. Moreover, ERA-HDHL will launch at least 3 additional JFAs in line to fulfil the JPI HDHL objectives. |
| Relevant links | <https://www.era-learn.eu/network-information/networks/era-hdhl> |

Innovative Medicine Initiative (IMI)

|  |  |
| --- | --- |
|  | At the Innovative Medicines Initiative (IMI), we are working to improve health by speeding up the development of, and patient access to, innovative medicines, particularly in areas where there is an unmet medical or social need. We do this by facilitating collaboration between the key players involved in healthcare research, including universities, research centres, the pharmaceutical and other industries, small and medium-sized enterprises (SMEs), patient organisations, and medicines regulators. IMI is the world's biggest public-private partnership (PPP) in the life sciences. It is a partnership between the European Union (represented by the [European Commission](http://ec.europa.eu/index_en.htm)) and the European pharmaceutical industry (represented by [EFPIA](http://www.efpia.eu/), the European Federation of Pharmaceutical Industries and Associations). Through the IMI2 programme, we have a [€3.3 billion budget](https://www.imi.europa.eu/about-imi/imi-funding-model) for the period 2014-2020. |
| Relevant links | <https://www.imi.europa.eu/apply-funding> |

## Stakeholders representing coordination and policy initiatives

[European infrastructure for translational medicine](https://eatris.eu/) - EATRIS

|  |  |
| --- | --- |
| **A close up of a sign  Description automatically generated** | The EATRIS infrastructure plays a fundamental role in the advancement of knowledge and technology in translational research and drug development. This distributed infrastructure, which is comprised of over 80 leading institutes and growing, constitutes a wide diversity of stakeholders who seek solutions to the many problems that we face in the development of new therapies.  The EATRIS infrastructure represents the bricks and brains of the scientific community in Europe that is focused on translational research. It consists of high-end facilities, resources, and expertise that is open to collaboration on your innovative drug or diagnostic development programme. |
| **Link** | https://eatris.eu/ |
| **Priorities** | The [Strategic Agenda](https://eatris.eu/strategic-research-innovation-agenda-2019-2022/) is built on five pillars (goals) that have the ambition of maximizing the impact of EATRIS on the translational medicine landscape.  Goal 1: Build on our academic credentials: reinforcing EATRIS community  Goal 2: Create an effective translational medicine ecosystem  Goal 3: Synchronise the capacities of the Medical RIs  Goal 4: Raise EATRIS awareness  Goal 5: Education and Training as a driving force for the Translational Medicine community |
| **Key documents** | [Projects](https://eatris.eu/projects/) |
| **Contact person(s)** | <https://eatris.eu/people/> |

[European CanCer Organisation - ECCO](https://www.ecco-org.eu/)

|  |  |
| --- | --- |
| **A close up of a logo  Description automatically generated** | ECCO is a not-for-profit federation that exists to uphold the right of all European cancer patients to the best possible treatment and care, promoting interaction between all organisations involved in cancer at European level.  It does this by creating awareness of patients’ needs and wishes, encouraging progressive thinking in cancer policy, training and education and promoting European cancer research, prevention, diagnosis, treatment and care through the organisation of international multidisciplinary meetings. |
| **Link** | ECCO |
| **Priorities** | ECCO’s current policy priorities are to:   * Drive improvement in quality of cancer care in Europe via multidisciplinarity; * Ensure patients gain access to innovation, in all forms of care; * Advocate for step change improvement in the integration of care; and * Highlight the core requirements of the oncology workforce to deliver the best care. |
| **Key documents** | [Publications](https://www.ecco-org.eu/ERQCC/ERQCC-Publications) |
| **Members** | ECCO represents and serves the interests of over 150 000 professionals in oncology through its 27 Member Societies (<https://www.ecco-org.eu/About-Ecco/Members>). |
| **Contact person(s)** | <https://www.ecco-org.eu/About-Ecco/Organisation/ECCO-Secretariat> |

[Association of European Cancer leagues - ECL](https://www.europeancancerleagues.org/)

|  |  |
| --- | --- |
| **A close up of a logo  Description automatically generated** | The Association of European Cancer Leagues (ECL) provides an exclusive platform for members to collaborate with their international peers, primarily in the areas of cancer prevention, tobacco control, access to medicines and patient support, and creates opportunities to advocate for these issues at the EU level. |
| **Link** | https://www.europeancancerleagues.org/ |
| **Priorities** | ECL’s VISION: A Europe free of cancers ECL’s MISSION: To advocate for improved cancer control and care in Europe through facilitating collaboration between cancer leagues and influencing EU and pan-European policies. |
| **Key documents** | [Publications](https://www.ecco-org.eu/ERQCC/ERQCC-Publications) |
| **Members** | <https://www.europeancancerleagues.org/members/> |
| **Contact person(s)** | <https://www.europeancancerleagues.org/ecl-board/>  <https://www.europeancancerleagues.org/secretariat/> |

[European Cancer Patient Coalition](https://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwj6nurvqejhAhWCIVAKHRd8DAgQFjAAegQIBhAD&url=http%3A%2F%2Fwww.ecpc.org%2F&usg=AOvVaw0QX1wW-LL0eIAgr0FVHHtO) – ECPC

|  |  |
| --- | --- |
| **A close up of a logo  Description automatically generated** | The European Cancer Patient Coalition (ECPC) is the voice of cancer patients in Europe. With over 400 members, ECPC is Europe’s largest umbrella cancer patients’ association, covering all 28 EU member states and many other European and non-European countries. ECPC represents patients aﬀected by all types of cancers, from the rarest to the most common. |
| **Link** | <http://www.ecpc.org/about-us> |
| **Priorities** | ECPC works for a Europe of equality, where all European cancer patients have timely and aﬀordable access to the best treatment and care available, throughout their life. ECPC believes that cancer patients are the most important partners in the ﬁght against cancer and against all the cancer-related issues aﬀecting our society. Policy makers, researchers, doctors and industry should recognise cancer patients as co-creators of their own health. |
| **Key documents** | <http://www.ecpc.org/about-us/vision-strategy> |
| **Members** | <http://www.ecpc.org/about-us/our-members> |
| **Contact person(s)** | <http://www.ecpc.org/about-us/contact> |

[European Oncology Nursing Society – EONS](http://www.cancernurse.eu/)

|  |  |
| --- | --- |
| **A picture containing clock  Description automatically generated** | The European Oncology Nursing Society is a pan-European organisation dedicated to the support and development of cancer nurses.  Through our individual members and national societies we engage in projects to help nurses develop their skills, network with each other and raise the profile of cancer nursing across Europe. |
| **Link** | <http://www.cancernurse.eu/> |
| **Priorities** | The CARE strategy will be implemented by the EONS Board, management team and our four working groups who focus on:   * Communication * Advocacy * Research * Education   All strategic goals are equal and assume no hierarchy. By the end of 2023, EONS will have achieved the following:   1. Cancer nursing is recognised across Europe for its positive impact on the lives of people affected by cancer through C.A.R.E. – Communication, Advocacy, Research and Education. 2. All cancer nurses have access to specialised education that is aligned with the EONS Cancer Nursing Education Framework. 3. All cancer nurses gain official recognition, reward and respect as a result of the RECaN and advocacy campaigns. 4. All cancer nurses are connected in order to exchange and share information and support for their work. 5. EONS facilitates, leads and promotes collaborative cancer nursing research across Europe. 6. EONS leads EU-wide advocacy initiatives at EU policy level. 7. EONS provides evidence-based advice to people and organisations affected by cancer on healthy lifestyles and cancer prevention. |
| **Key documents** | <http://www.cancernurse.eu/communication/index.html> |
| **Contact person(s)** | <http://www.cancernurse.eu/about_eons/contact_eons.html> |

European Society for Radiotherapy & Oncology – ESTRO

|  |  |
| --- | --- |
| **A picture containing clipart  Description automatically generated** | ESTRO’s new vision statement for 2030 ‘Radiation Oncology. Optimal Health for All, Together.’ emphasizes the ambition of the Society to further reinforce radiation oncology as core partner in multidisciplinary cancer care and to guarantee accessible and high-value radiation therapy for all cancer patients who need it.  To do so, it will actively focus on translating science and evidence into practice. It will continue to support all radiotherapy professionals in their needs of continuous professional development. The needs of a growing Society in terms of governance and leadership will actively be addressed. The Society will also increasingly embrace its role in policy, through a broadening network of partnerships with all relevant stakeholders.  Without calling for a disruptive change with the past, but conscious of the challenges ahead, the ESTRO vision statement for 2030 is ambitious, expansive, inclusive and open to the future. |
| **Link** | <https://www.estro.org/> |
| **Priorities** | The mission of ESTRO, a non-profit, scientific organisation, shall be to foster, in all its aspects, radiotherapy (also known as radiation oncology), clinical oncology and related subjects, including physics as applied to radiotherapy, radiation technology and radiobiology.  To fulfil its mission ESTRO will:   * Develop and promote standards of education in radiotherapy and clinical oncology * Promote standards of practice in radiotherapy, clinical oncology and related subjects * Stimulate the exchange of scientific knowledge in all related fields * Strengthen the clinical specialty of radiotherapy and clinical oncology in relation to other specialties and professions involved in cancer management * Encourage co-operation with international, regional and national societies and bodies representing radiotherapy, clinical oncology and related subjects * Facilitate research and development in radiotherapy, clinical oncology and related subjects. |
| **Key documents** | <https://elibrary.estro.org/> |
| **Contact person(s)** | <https://www.estro.org/Contact> |
| **Calls** | [Courses](https://www.estro.org/Courses) |

European Technology Platform Nanomedicine – ETP Nanomedicine

|  |  |
| --- | --- |
| **A close up of a sign  Description automatically generated** | The ETP Nanomedicine (ETPN) is an initiative led by industry since 2005 and set up together with the [European Commission](https://ec.europa.eu/), to address the application of nanotechnology in healthcare. The ETPN believes that involving industry will accelerate the development of promising ideas, and provide the effective and safe healthcare products that patients demand.  The ETPN is officially recognized as an ETP, a key element in the European innovation ecosystem and a main bridge between the community and the European Commission to implement Research FrameWork Programmes.  The ETPN acts as [The Think Tank of Nanomedicine in Europe](https://etp-nanomedicine.eu/about-nanomedicine/european-funding/) and [A driving force for industrialization](https://etp-nanomedicine.eu/about-nanomedicine/european-funding/). |
| **Link** | <https://etp-nanomedicine.eu/> |
| **Key documents** | The strategic research priorities of the ETP Nanomedicine represent the core fields of interest and activities of the members of the technology platform: Regenerative Medicine and Biomaterials, Nanotherapeutics (including drug delivery), Medical devices including Nanodiagnostics and Imaging. |
| **Members** | The association gathers today more than [125 members from 25 different Member States](https://etp-nanomedicine.eu/members/list-of-etpn-members/), covering all stakeholders of Nanomedicine: academia, SMEs, industry, public agencies, representatives from national platforms, European Commission, etc. |
| **Contact person(s)** | <https://etp-nanomedicine.eu/about-etpn/contacts/> |

Real-World and Analytical Solutions Global Team – IQVIA

|  |  |
| --- | --- |
| **A picture containing object  Description automatically generated** | **IQVIA, The Human Data Science CompanyTM**  Healthcare is an industry designed to help humans. As a global community, we continuously invest and commit to advancing human health. To deliver value and real outcomes. To rise to the challenge to find the next breakthrough by making the most of increasingly limited resources.  We are inspired by the potential and propelled by the possibilities. We share the vision to drive healthcare forward. To see how we can help accelerate progress and achievements. Others are developing these medical breakthroughs. We do our part by using breakthroughs in insights, technology and human intelligence to reimagine and deliver ways to help make them a reality. |
| **Link** | <https://www.iqvia.com/locations/united-states/real-world-evidence> |
| **Priorities** | **Our commitment in action**  Through collaboration, we hope to overcome some of the biggest challenges facing global health.   * Leading the Way in Drug Safety * Fighting the Opioid Epidemic * Bridging Oncology Gaps * Addressing Antibiotic Resistance * Assessing Disease Burden, Enabling Innovation * Malaria Access in Action * Enabling Alzheimer’s Insights |
| **Key documents** | <https://www.iqvia.com/> |
| **Contact person(s)** | <https://www.iqvia.com/locations/belgium> |

Politico

|  |  |
| --- | --- |
|  | POLITICO Europe is the European edition of the American news organization [Politico](https://en.wikipedia.org/wiki/Politico) reporting on the [European Union](https://en.wikipedia.org/wiki/European_Union). It is considered the most influential publication on European affairs. The majority of the publication's articles cover the day-to-day business of the [European Commission](https://en.wikipedia.org/wiki/European_Commission), the [European Parliament](https://en.wikipedia.org/wiki/European_Parliament), the [Council of the European Union](https://en.wikipedia.org/wiki/Council_of_the_European_Union) and the EU's interactions in domestic and international affairs. It also organizes and hosts EU-related conferences, seminars, and debates.  The POLITICO’s Global Policy Lab: Decoding Cancer, is a collaborative journalism project seeking to explore how patients, communities, policymakers and the private sectors are grappling with one of Europe’s most pressing health challenges. This initiative was funded by Pfizer Oncology and IBM Watson Health. |
| **Link** | [www.politico.eu](http://www.politico.eu) |
| **Key documents** | <https://www.politico.eu/global-policy-lab/> |

European Commission - Joint Research Centre (JRC)

|  |  |
| --- | --- |
|  | The Joint Research Centre (JRC) is the European Commission's science and knowledge service which employs scientists to carry out research in order to provide independent scientific advice and support to EU policy. |
| Relevant links | <https://ec.europa.eu/jrc/en/research-topic/medical-applications-radionuclides-and-targeted-alpha-therapy> |

ERA-NET - Transcan-2

|  |  |
| --- | --- |
|  | The ERA-NET: Aligning national/regional translational cancer research programmes and activities - TRANSCAN-2 is a five-year project (2015-2019) funded by the European Commission under the EU framework programme Horizon2020 (Grant Agreement no. 643638).  It is the continuation of the previous ERA-NET on translational cancer research TRANSCAN, funded under the FP7 from 2011 to 2014.  TRANSCAN-2 is a collaborative network of ministries, funding agencies and research councils with programmes in translational cancer research. The network is composed of [28 partners](https://www.transcanfp7.eu/index.php/partners/transcan-2-partners.html) from 19 Countries. |
| Relevant links | <https://www.transcanfp7.eu/> https://www.transcanfp7.eu/index.php/pages/funded-projects.html |

Systems Medicine to address clinical needs (ERACoSysMed)

|  |  |
| --- | --- |
|  | The ERA-Net ERACoSysMed "Collaboration on systems medicine funding to promote the implementation of systems biology approaches in clinical research and medical practice" started in January 2015 as the first ERA-Net on Systems Medicine under the EU Framework Programme Horizon2020.  The Coordination Action Systems Medicine, [CASyM](http://www.casym.eu/" \t "_blank) drafted a roadmap for the implementation of systems medicine in Europe. This roadmap has been the strategic guide to formulate key objectives of ERACoSysMed.  The 14 funding bodies participating in ERACoSysMed joined forces to enhance the implementation of systems biology approaches in both clinical research and medical practice throughout Europe and Israel. The challenge of establishing systems medicine in Europe is addressed by developing transnational cooperation between national ministries and funding bodies. As a common action, joint transnational calls have been implemented to demonstrate the feasibility and socio-economic benefits of systems medicine in clinical practice. |
| Relevant links | https://www.eracosysmed.eu/ |

South East European International Institute for Sustainable Technologies (SEEIIST)

|  |  |
| --- | --- |
|  | The South East European International Institute for Sustainable Technologies (SEEIIST) proposed in late 2016 by Prof. Herwig Schopper, a former Director General of CERN and initiator of the international SESAME project in Jordan, received first official political support by the Government of Montenegro in March 2017.  After the signing of the Declaration of Intent in October 2017 at CERN, the Initiative was transformed into a Regional project gathering following Parties: Republic of Albania, Bosnia and Herzegovina, Republic of Bulgaria, Kosovo\*, The FYR Macedonia, Montenegro, Republic of Serbia and Republic of Slovenia  Initially, there were two project options: a ‘4th Generation Synchrotron Light Source’ that would offer a broad spectrum of research and industrial applications, and a state-of-the-art ‘Facility for Hadron Tumour Therapy and Biomedical Research with protons and heavier ions’. Concept Studies behind each proposal were worked out by the two groups of the international experts.  At the second SEEIIST SC meeting, held on 30 March 2018 in Tirana (Republic of Albania), SC members took an unanimous decision to support the Hadron Cancer Therapy and Biomedical Research with Protons and Heavy Ions as the option for the Institute. Moreover, SC reached an agreement on a Draft of the Memorandum of Cooperation (MoC). |
| Relevant links | <http://seeiist.eu/> |

# **List of participants**

|  |  |  |  |
| --- | --- | --- | --- |
| Last name | First name | Organisation // COST Action and/or projects (if applicable) | E-mail |
| Alcaro | Stefano | Universitá Magna Graecia di Catanzaro // CA15135 | alcaro@unicz.it |
| Andreu | Toni | EATRIS | toniandreu@eatris.eu |
| Bettio | Manola | European Commission European Cancer Information System (ECIS) | manola.bettio@ec.europa.eu |
| Botta | Bruno | Sapienza University of Rome // CM1407 | bruno.botta@uniroma1.it |
| Brandau | Sven | University Hospital Essen and West German Cancer Center // BM 1404 | sven.brandau@uk-essen.de |
| Brierley | Chrissie | JPI Healthy Diet for a Healthy Life | brierley@zonmw.nl |
| Cardinale | Vincenzo | Sapienza European Network for the Study of Cholangiocarcinoma | vincenzo.cardinale@uniroma1.it |
| Cardone | Antonella | ECPC (European Cancer Patient Coalition) | antonella.cardone@ecpc.org |
| Cassetta | Luca | University of Edinburgh | luca.cassetta@ed.ac.uk |
| Ceccaldi | Alexandre | European Technology Platform on Nanomedicine (ETPN) ETPN, NOBEL Project, HealthTech TAB, HealthTech World Cancer Day | alexandre.ceccaldi@etp-nanomedicine.eu |
| Coux | Olivier | CRBM-CNRS // BM1307 | olivier.coux@crbm.cnrs.fr |
| Dadeshidze | Inga | COST Association | inga.dadeshidze@cost.eu |
| Damjanovic | Sanja | Ministry of Science of Montenegro http://seeiist.eu | sanja.damjanovic@mna.gov.me |
| De las Rivas | Javier | Cancer Research Center (CiC-IBMCC, USAL/CSIC) // CA17104, CA17118 | jrivas@usal.es |
| De Lorenzo | Francesco | European cancer Patient Coalition | fdelorenzo2@gmail.com |
| De Voer | Richarda | Radboudumc // CA17118 | richarda.devoer@radboudumc.nl |
| Defourny | Noémie | European Society for Radiotherapy & Oncology | ndefourny@estro.org |
| Dosztányi | Zsuzsanna | Eötvös Loránd University // BM1405 | dosztanyi@caesar.elte.hu |
| Eicher | Manuela | University of Lausanne and Lausanne University Hospital EONS | manuela.eicher@chuv.ch |
| Fauvel | Charlotte | EATRIS CORBEL (H2020) // CA16113 | Annecharlottefauvel@eatris.eu |
| Figueroa Conde-Valvís | Angélica | Instituto de Investigación Biomédica A Coruña (INIBIC) // BM1402 | angelica.figueroa.conde-valvis@sergas.es |
| Flatmark | Kjersti | Oslo University Hospital // CA17101 | kjersti.flatmark@rr-research.no |
| Fortes | Puri | CIMA / UNAV // CA17103 | pfortes@unav.es |
| Forzi | Lucia | COST Association | lucia.forzi@cost.eu |
| Ganesan | A. | University of East Anglia // CM1406, TD0905 | a.ganesan@uea.ac.uk |
| García Ibáñez | Laura | European Commission | Laura.Garcia-Ibanez@ec.europa.eu |
| Klajnert-Maculewicz | Barbara | University of Lodz // CA17140 | aklajn@biol.uni.lodz.pl |
| Krafft | Christoph | Leibniz Institute of Photonic Technology // BM1401 | christoph.krafft@leibniz-ipht.de |
| Kroll | Adeline | European Commission | Adeline.KROLL@ec.europa.eu |
| León-Sanz | Miguel | University Hospital Doce de Octubre | mlshdoc@gmail.com |
| Litjens | Judith | COST Association | judith.litjens@cost.eu |
| Mauricaité | Donata | Lithuanian RDI Liaison Office LINO | Donata.mauricaite@lmt.lt |
| Milonjic | Milena | Ministry of Science | milena.milonjic@mna.gov.me |
| Nativi | Cristina | University of Florence // CA18132 | cristina.nativi@unifi.it |
| Nikolic | Katarina | Faculty of Pharmacy, University of Belgrade // CA18133 | knikolic@pharmacy.bg.ac.rs |
| O'Loughlin | Declan | National University of Ireland Galway // CA17115 | declan.oloughlin@nuigalway.ie |
| Ortega | Daniel | IMDEA Nanoscience // TD1402, NoCanTher | daniel.ortega@imdea.org |
| Ortelli | Federica | COST Association | federica.ortelli@cost.eu |
| Paradisi | Silvia | Istituto Superiore di Sanitá ERA-NET TRANSCAN-2 | silvia.paradisi@iss.it |
| Parolini | Ornella | Universitá  Cattolica del Sacro Cuore // CA17116 | ornella.parolini@unicatt.it |
| Pennarossa | Georgia | Universitá degli Studi di Milano // CA16119 | georgia.pennarossa@unimi.it |
| Price | Richard | European CanCer Organisation (ECCO) | richard.price@ecco-org.eu |
| Quattrone | Alessandro | University of Trento // CA16120 | alessandro.quattrone@unitn.it |
| Quintas | Mafalda | COST Association | [mafalda.quintas@cost.eu](mailto:mafalda.quintas@cost.eu) |
| Rodrigues | Pedro Miguel | Biodonostia Health Research Institute (BHRI) // CA18122 | pedro.rodrigues@biodonostia.org |
| Schmidt | Harald | Maastricht University // CA15120 | h.schmidt@maastrichtuniversity.nl |
| Solov'yov | Andrey | MBN Research Center // CA17126, MP1002, ITN ARGENT (finished in 2018), MSCA-RISE PEARL (running), DFG funded projects | solovyov@mbnresearch.com |
| Turner | Michelle | Barcelona Institute for Global Health (ISGlobal) // CA16216 | michelle.turner@isglobal.org |
| Van Ansem | Wilke | JPI HDHL | ansem@zonmw.nl |
| Veys | Bart | COST Association | bart.veys@cost.eu |
| Vouldis | Ioannis | European Commission | Ioannis.Vouldis@ec.europa.eu |
| Weiers | Stefan | European Commission | Stefan.Weiers@ec.europa.eu |
| Wheaton | Sarah | Politico | swheaton@politico.eu |
| Wilson | Clive | University of Strathclyde // CA16205 | c.g.wilson@strath.ac.uk |
| Woodford | Emma | European Oncology Nursing Society | eons.director@cancnernurse.eu |
| Woolmore | Ashley | IQVIA Lead the Collaboration for Oncology Data in Europe | ashley.woolmore@iqvia.com |
| Yared | Wendy | Association of European Cancer Leagues (ECL) | wendy@europeancancerleagues.org |

**Notes**

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

******

**Continue the conversation!**

Tweet your thoughts:

@COSTprogramme

#COSTconnect

Other useful Twitter hashtags:

#ResearchImpactEU

#ResearchPolicy

#InvestEUResearch

#H2020

#FP9

Visit our website [www.cost.eu](http://www.cost.eu/) or sign up for our news at [www.cost.eu/news](https://www.cost.eu/news/)

Join us on our social networks:



@[COST.Programme](http://www.facebook.com/COST.Programme/)



[@COSTprogramme](https://twitter.com/COSTprogramme)



[COST Association](https://www.linkedin.com/company-beta/1050548/)



[COST (European Cooperation in Science and Technology)](https://www.youtube.com/user/COSTOffice)

1. [www.cost.eu/COST\_Actions/all\_actions](http://www.cost.eu/COST_Actions/all_actions) [↑](#footnote-ref-2)
2. Gephi 0.9.2 – Algorithm: Vincent D Blondel, Jean-Loup Guillaume, Renaud Lambiotte, Etienne Lefebvre, Fast unfolding of communities in large networks, in *Journal of Statistical Mechanics*: Theory and Experiment 2008 (10), P1000.

   Resolution: R. Lambiotte, J.-C. Delvenne, M. Barahona Laplacian Dynamics and Multiscale Modular Structure in *Networks* 2009.

   Colours indicate a different modularity class. The thicker the line between the bubbles, the higher the number of common participants. The larger the bubble the bigger the network. [↑](#footnote-ref-3)