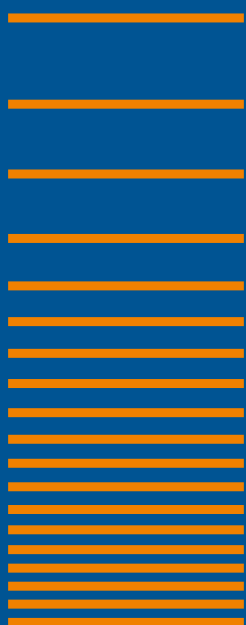


# Achievements of FP7

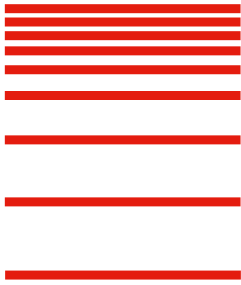
*examples that make us proud*



## **Acknowledgements**

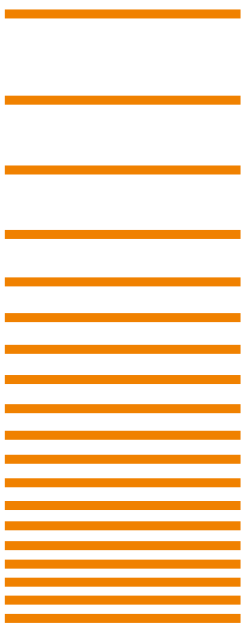
This booklet is a true, but humble, product of European cooperation, just like the inspiring examples it contains. All of the content was contributed by country delegations and collected to support the discussion at the Informal Meeting of Ministers for COMPET (Research) in Amsterdam during the Netherlands Presidency of the Council of the EU. All contributions reflect inspiring examples of the excellence and impact of research and innovations projects.

We thank everyone for their contribution.



# Achievements of FP7

*examples that make us proud*







# Contents

Foreword	5
Austria	6
Belgium	9
Bulgaria	13
Croatia	16
Cyprus	19
Czech Republic	21
Denmark	25
Estonia	27
Finland	29
Finland/Germany	31
France	34
Germany	38
Greece	42
Hungary	46
Iceland	49
Ireland	51
Israel	54
Latvia	56
Lithuania	58
Luxembourg	62
Malta	64
The Netherlands	67
Norway	72
Poland	74
Portugal	76
Romania	78
Slovakia	82
Slovenia	85
Spain	88
Sweden	92
Switzerland	95
Turkey	97
United Kingdom	99



Electric vehicle  
Source: Hannah Anthonysz /  
Rotterdam Image Bank

# Foreword

An innovative society cannot thrive without the continued development of knowledge. To gain new, state-of-the-art knowledge, researchers and enterprises need to have access to the best knowledge, best facilities and best networks across borders and disciplines. Together, we enable this cross-border cooperation through excellent national and European (Framework) programmes. We strive for impact and success by securing funding, access and collaboration, and by putting in place the right framework conditions for an attractive research and innovation climate in Europe.

Ground breaking research and innovation are exciting and useful for creating jobs and stimulating growth. Compiled in this booklet, your contributions demonstrate the substantial impact of investments in research and innovation through the European Framework Programmes. Moreover, these EU projects show the added value of research and innovation projects for the economy and for national, regional and local communities.

With this booklet we show that investments in research and innovation, including short- and long-term investments, have a significant and real impact on Europe's economy and society. I hope it inspires all readers to vouch for a more innovative and competitive Europe. A Europe that aims to attract investors, innovative enterprises and the best researchers. A Europe that aims to foster sustainable economic growth and to solve the societal challenges we are all faced with.

Also on behalf of the Minister of Economic Affairs, Mr Henk Kamp,



Sander Dekker

State Secretary for Education, Culture and Science  
*Chair of the informal meeting of Ministers for COMPET (Research)*

# Austria

## Name

M-ERA.NET

## Year/duration

02/2012 - 01/2016 (four years)

## Website

[www.m-era.net](http://www.m-era.net)

## Results

The M-ERA.NET consortium contributed to the restructuring of the European Research Area (ERA) by operating as a single innovative and flexible network of funding organisations.

## The project:

- generated added value for society, economy, human life;
- triggered private investment and fostered new knowledge;
- created synergies with regional funds;
- strengthened the international cooperation.

## Expected socio-economic impact

- M-ERA.NET mobilised a budget of more than 80 million € from national and regional programmes for R&D in materials research.
- M-ERA.NET fostered the convergence of funding programmes by streamlining programme procedures and allowing for a more efficient use of resources.
- The project had a major impact on the efficiency in the coordination and cooperation of funding programmes in EU Member States and Associated States and boosted progress in research, technological development, innovation in the field of industrial technologies and particularly materials research.
- M-ERA.NET contributed to achieving consolidated research cooperation within the EU and improved cooperation with Third Countries. Programme owners from Brazil, Korea, Russia and Taiwan are network partners. Contacts



Call 2012:  
30 funding orgs.  
23 European countries  
+ Taiwan

Call 2013:  
32 funding orgs.  
22 European countries  
+ Russia + Taiwan

Call 2014:  
36 funding orgs.  
22 European countries  
+ Russia + Taiwan

Call 2015:  
35 funding orgs.  
22 European countries +  
Brazil (Sao Paulo) + Korea  
+ Russia + Taiwan



124 pre-proposals  
72 full proposals  
23 funded projects



166 pre-proposals  
90 full proposals  
26 funded projects



172 pre-proposals  
105 full proposals  
21 funded projects



156 pre-proposals  
93 Full Proposals

Overview Calls



with Japan, USA, South-Africa were established.

- M-ERA.NET provided broad support for the research and innovation chain as it addressed the Technology Readiness Levels (TRL) 2-7 with national and regional funding schemes for research projects.
- Furthermore the exploitation of research results was fostered through dedicated activities (valorisation workshop, conferences, exhibitions, project/technology catalogues). In particular M-ERA.NET used parallel sessions as part of existing large technical conferences to minimise costs.

The funded transnational projects paved the way for international cooperation in the NMP area:

### Description

M-ERA.NET is an EU funded network which has been established to support and increase the coordination of European research programmes and related funding in materials science and engineering.

M-ERA.NET is a real tool for developing a strong European RTD community on materials science and engineering and for supporting the European economy with respect to the challenges of the 21st century. Building on previous, M-ERA.NET is a highly ambitious network involving a majority of European key players in national funding of materials science and engineering.

M-ERA.NET set up a multi-annual policy for joint programming targeted at the whole innovation cycle. Cooperation at an



international level will enable the European RTD community to access world leading knowledge.

It is the mission to

- strengthen the status of the European RTD community and economy in materials sciences and engineering;
- mobilise a critical mass of national and regional funding for transnational RTD cooperation in materials science and engineering, thereby achieving a very large leverage effect of the requested FP7 funding;
- set up a novel concept for cooperation to react to emerging needs and to allow coverage of future topics in related thematic areas;
- establish strategic programming of joint activities, addressing societal and technological challenges in an interdisciplinary approach;
- support the exploitation of created knowledge along the whole innovation chain;
- enable enlarged research cooperation within the EU Member States and Associated States;
- establish international cooperation with partners outside Europe;
- exploit the novel developments and strengthen a durable, long term cooperation between funding organisations.

### **Cooperation countries**

Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Hungary, Iceland, Israel, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, United Kingdom; Additional Observer Countries: Brazil, Republic of Korea, Russia, Switzerland, Taiwan

### **FP7 Evaluation Achievements**

This project relates to the following achievements of the Ex-Post-Evaluation:

3. Engaged industry and SMEs strategically.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
7. Encouraged harmonisation of national research and innovation systems and policies.
10. Reached a critical mass of research across the European landscape and worldwide.

# Belgium

## Name

Silicon Europe – Developing a leading-edge European micro- and nanoelectronics cluster for energy-efficient ICT

## Year/duration

1/10/2012 – 31/10/2015 (three years)

## Website

[www.silicon-europe.eu](http://www.silicon-europe.eu)

## Results

The FP7/Regions of Knowledge (RoK) project *Silicon Europe* has led to the foundation of the *Silicon Europe Alliance*. This cluster alliance is among the top3 of the European cluster alliances, together with the biotech clusters alliance Bio-X and the aeronautics clusters alliance EACP. From the start, 6 more clusters have joined the 6 clusters involved in the FP7-project Silicon Europe (see “description” section below) in the Silicon Europe Alliance: SCS from Nice (France), Mi-cluster from Athens (Greece), Midas from Cork (Ireland), NMI from Livingston (UK), Distretto G&HT Monza-Brianza from Milan (Italy) and GAIA from Bilbao (Spain). DSP Valley from Leuven, Belgium, holds the chairmanship of the Silicon Europe Alliance. Together, these 12 clusters connect about 1.600 companies within the field of micro- and nanoelectronics.

The Silicon Europe Alliance stands for a new, industry-led level of transnational collaboration. It transfers the national cluster concept – strong cooperation across organizational and institutional

borders – onto a transnational level. The Silicon Europe Alliance aims at maximizing previously unused synergies between clusters and strengthening the activities of the cluster alliance and their members as a whole.

## Expected socio-economic impact

The Silicon Europe Alliance brings together the technological expertise and resources of Europe’s leading players in micro- and nanoelectronics. By designating micro- and nanoelectronics as one of Europe’s Key Enabling Technologies (KETs), the European Commission acknowledges the importance of the sector for the development of industry in Europe as well as for the future prosperity of the entire continent. Also, micro- and nanoelectronics are essential for sustainable growth. The Silicon Europe Alliance “clustering the clusters” in the field of micro- and nanoelectronics has the objective to bolster Europe’s position as the world’s leading centre for innovative electronics while effectively working to counteract societal challenges by developing solutions such as clean, secure and efficient energy supply or smart, green and integrated transport systems. Europe’s microelectronic sites are globally recognized for their prowess in developing and using semiconductors and innovative electronics. Silicon Europe unites the strongest European clusters to form a European alliance with access to the most advanced technologies and expertise at all levels of the micro- and nanoelectronics value chain. This “cluster



of clusters” stands for a whole new level of transnational collaboration and a combined innovative strength that will significantly contribute to the future competitiveness of the European economy.

### Description

*Silicon Europe* was funded and carried out within FP7’s Regions of Knowledge (RoK) activity. six European regional clusters specializing in micro- and nanoelectronics (Silicon Saxony from Dresden [Germany], Minalogic from Grenoble [France], DSP Valley from Leuven [Belgium] and High Tech NL from Eindhoven [The Netherlands] as project partners, and Business Cluster Semiconductors from Nijmegen [The Netherlands] and ME2C from Villach [Austria] as associated partners) joined forces to establish a strategic plan to improve the global competitiveness of the participating companies and research institutes in the field of (energy-efficient) micro- and nanoelectronics. The (meanwhile delivered) strategic plan features actions concerning the following themes:

- inter-cluster technology transfer;
- easier access to (public and private) funding sources for SMEs;
- international business development for the cluster members;
- Smart Specialisation based on micro- and nanoelectronics as a Key Enabling Technology (KET);
- promotion of Europe’s competences in the field of micro- and nanoelectronics using “Silicon Europe” as a brand name.

The strategic plan provides various levels for international business development:

- stimulation of European interregional collaboration with companies from the other electronics clusters;

- stimulation of European interregional collaboration with companies from other thematic/technological clusters aiming at applying micro- and nanoelectronics as a KET (e.g. automotive, health, energy, ...);
- stimulation of international collaboration with companies from clusters outside Europe.

With an eye to the strategic plan’s (further) implementation, the 6 abovementioned clusters have established the “Silicon Europe Alliance” (see “results” section above). Although in essence aiming at strategy definition, the first concrete actions were already set up and the first concrete results were already achieved during Silicon Europe’s FP7 project duration. Examples of actions include international business development actions towards regions outside Europe (US, Taiwan, ...) and targeted actions to support and stimulate the participation of the Silicon Europe clusters’ SMEs in European programmes (e.g. Horizon 2020/ ECSEL) and EUREKA programmes (e.g. ITEA, PENTA, Euripides and Eurostars). Examples of concrete results include interregional collaboration between companies from different Silicon Europe clusters, in terms of both funded R&D projects and commercial collaboration (e.g. Sofics from DSP Valley with Creative Chips from Silicon Saxony), and also the further strengthening of inter-cluster networking and collaboration through mutual partaking in cluster flagship events (e.g. Dresden’s Silicon Saxony Days, Grenoble’s Minalogic B2B day and DSP Valley’s Smart Systems Industry Summit).

### Cooperation countries

Austria, Belgium, France, Germany, The Netherlands. (Afterwards, Greece, Ireland, Italy, Spain and the UK have joined the Silicon Europe Alliance).

### FP7 Evaluation Achievements

3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the ERA by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national/regional research and innovation systems and policies.



### Name

ICARUS – Integrated Components for Assisted Rescue and Unmanned Search operations

### Year/duration

1/2/2012 – 31/1/2016 (four years)

### Website

[www.fp7-icarus.eu](http://www.fp7-icarus.eu)

### Results

The objective of the ICARUS project was to develop unmanned tools which can assist relief teams which are sent out to save people after major crises (earthquakes, typhoons, shipwrecks, ...). ICARUS went well beyond the development of these

tools in a pure research context, but actively engaged with the end users on the terrain, thereby not only focussing on the technical challenges related to the development of the unmanned tools, but also the challenges related to the integration of these tools into the standard operating procedures of the end users. ICARUS went very far into the operational validation of its tools, even contributing to a real relief operation with an unmanned aerial vehicle during the Spring 2014 floods in Bosnia-Herzegovina. The tool was used for damage assessment, aerial inspection, mapping, dyke breach detection and for detecting the possible locations of landmines and Explosive Remnants of War (ERWs) displaced by the landslides ([www.youtube.com/watch?v=ThwH2jSwinQ&feature=youtu.be](http://www.youtube.com/watch?v=ThwH2jSwinQ&feature=youtu.be)).

### Expected socio-economic impact

ICARUS has paved the way for the introduction of unmanned search and rescue tools into the standard toolkit of relief workers in multiple ways:

- via scientific and technological breakthroughs (to mention one: the world endurance record of 81 hours of continuous autonomous flight for a small solar aeroplane: [www.youtube.com/watch?v=8m4\\_NpTQnoE](http://www.youtube.com/watch?v=8m4_NpTQnoE));
- via increasing the interoperability between robotic devices and developing a unique command and control station capable of controlling any unmanned tool;
- by carefully interacting with the end users at each step in the development process and thereby driving the user acceptance of the unmanned tools;
- by pushing the legal framework for the introduction of unmanned tools by

careful and extended dialogue with all authorities concerned and by organising conferences on this subject matter (to mention one achievement: ICARUS made the first-ever completely legal flight in the EU capital Brussels: [www.fp7-icarus.eu/news/icarus-makes-first-ever-legal-rpas-flight-brussels](http://www.fp7-icarus.eu/news/icarus-makes-first-ever-legal-rpas-flight-brussels)).

The socio-economic impact of the ICARUS project is therefore enormous. The Bosnia mission already proved this, with statements of rescue workers saying that the intervention of the ICARUS tool saved them days of work. Moreover, the ICARUS tool was not only able to speed up the relief operations, but also to detect land mines, which presented a real danger to the population and rescue workers. This ICARUS mission in Bosnia was globally the first-ever international deployment of an official state-run rescue team (the Belgian First Aid and Support Team, which was activated in the framework of the EU Civil Protection Mechanism) with an unmanned aerial vehicle in another country outside the EU (Bosnia-Herzegovina).

### **Description**

After the earthquakes in Italy (L'Aquila), Haiti and Japan, the European Commission (EC) confirmed that there exists a large discrepancy between (robotic) technology which is developed in laboratory and the use of such technology on the terrain for Search and Rescue (SAR) operations and crisis management.

Thus, the EC's (former) DG for Enterprise and Industry decided to fund ICARUS, a research project aiming to develop robotic tools which can assist "human" crisis intervention teams.

The introduction of unmanned SAR devices can offer a valuable tool to save human lives and to speed up the SAR process. ICARUS concentrates on the development of unmanned SAR technologies for detecting, locating and rescuing humans.

There is a vast literature on research efforts towards the development of unmanned SAR tools. However, these research efforts stand in contrast to the practical reality in the field, where unmanned SAR tools have great difficulty finding their way to the end users.

The ICARUS project addressed these issues, aiming to bridge the gap between the research community and end users, by developing a toolbox of integrated components for unmanned SAR.

### **Cooperation countries**

Austria, Belgium, France, Germany, Italy, Poland, Portugal, Spain, Switzerland

### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
4. Reinforced a new mode of collaboration and an open innovation framework.
6. Addressed certain societal challenges through research, technology and innovation.
10. Reached a critical mass of research across the European landscape and worldwide.

# Bulgaria

## Name

AComIn: Advanced Computing for Innovation

## Year/duration

Start 2012 (42 months)

## Website

[www.iict.bas.bg/acomin](http://www.iict.bas.bg/acomin)

## Results

- Increased research productivity and the quality of the scientific publications - more than 130%.
- Human Resources Enhancement - recruitment of more than 20 foreign and Bulgarian post-doc researchers with long-term contracts, as well as supporting 24 PhDs.
- Strengthened partnership with the business with more than 13 projects funded via ESIF and 15 contracts for industrial research, funded directly by Bulgarian companies.
- Innovation impact through granted two certificates of industrial design; Three WIPO patent applications and three more to the Bulgarian Patent Office (BPO); Software developed within project - a Technology Computer Aided Design tool - TCAD); a language resource – core Bulgarian WordNet; an annotated multisignal corpus of Bulgarian speech, developed using AComIn Speech Lab.

## Expected socio-economic impact

AComIn constituted the Bulgarian Institute of Information and Communication

Technologies (IICT) as a leading RTD Centre in Eastern Europe, providing facilities and working conditions comparable to the average standards of the EU-15 Centres of Excellence. IICT will be an attractive employer and partner due to the international recognition of its scientific quality and its unique infrastructure. Inside the country, IICT will become a dynamic innovation engine, supporting the sustainable regional and national growth and employment.

AComIn project turned to be an important tool also for scientific diplomacy in the region and helped to young researchers from Ukraine.

## Description

AComIn created modern infrastructure and environment that increased the knowledge and the skills of IICT researchers in emerging areas in the area of parallel and distributed algorithms, linguistic and semantic technologies, pattern recognition, intelligent and hierarchical systems, and signal processing. During the project duration, its researchers participated in 33 international conferences and published their research results in more than 100 scientific papers. The IICT reinforced innovation capacity enabled technology transfer to the high-tech industry, thus increasing the efficiency and competitiveness of the Bulgarian economy.

## Cooperation countries

Bulgaria is a single beneficiary. In the Steering Board have been involved



partners from United Kingdom, Germany, Italy, Greece, Sweden

### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
2. Engaged industry and SMEs strategically.
5. Addressed certain societal challenges through research, technology and innovation.
7. Stimulated mobility of researchers across Europe.
9. Reached a critical mass of research across the European landscape and worldwide.





Above: Rotterdam market hall. Source: Corbis

Below: Glow lichtkunstfestival. Source © PHILIPS



# Croatia

## Name

CURE project - Developing the Croatian Underwater Robotic Research Potential

## Year/duration

04/2009 – 03/2012

## Website

[cure.fer.hr](http://cure.fer.hr)

## Results

- *Upgraded research capacity*  
i.e. the human potential, the number of new researchers and training of research staff, improvement of research management, strengthening the research infrastructure and the quality of research.
- *Integration in the European Research Area (ERA)*  
Partnership with research groups in the EU contributed to regional capacity building and improved LABUST's (Laboratory for Underwater Systems and Tehcnologies) underwater robotics research potential.
- *Publications/conferences.*  
Around 13 publications were achieved per year and there was increased attention at international conferences and exchange our research results with colleagues.
- *New developments*  
New developments were initiated such as use of cloud computing (consumer programming) for the mission planning and report generation after the mission.

## Dissemination/collaboration

Some other research groups are experimenting with the developed method (University of Limerick, Department of Electronic and Computer Engineering, Limerick, Ireland; Instituto Superior Tecnico, Institute for Systems and Robotics, Dynamical Systems & Ocean Robotics Lab, Lisbon, Portugal).



## Expected socio-economic impact

CURE had an impact in the whole region in the domain of underwater robotics (underwater systems and technologies) R&D and clustering. LABUST (Laboratory for Underwater Systems and Tehcnologies) is a light partner in the Network of excellence HYCON<sub>2</sub>) offered services for all interested parties (R&D groups, end-user community, industrial sectors (SMEs), governmental bodies, general public):

1. Those involved in R&D had the possibility to search for partners, exchange information about their own and possible joint R&D projects, exchange information about European RTD projects in Embedded Systems & Control, Robotics, Marine security, etc.
2. End-user community had the possibility to use LABUST expertise for their applications, and to use our developed solutions there.
3. SMEs had the possibility to embark on new production/services for the sub-sea community with the LABUST help.
4. Governmental bodies had the possibility to use our expertise for their needs in fulfilling legal obligations related to

various domains (nature protection, maritime security, cultural protection, etc.) for the sub-sea domain in Croatia.

5. Students had the opportunity to be involved in some very interesting and far reaching activities with our laboratory. Some of them embark on R&D in this fast changing research area.
6. General public was well informed to frequent coverage by press/media.

### Description

CURE project - Developing the Croatian Underwater Robotic Research Potential may be more relevant in the EU-wide perspective rather than a regional perspective. Hence, the REGPOT support has mainly contributed to enhancing the research capacities and results so that the CURE team has become well-accepted among EU and other international colleagues.

The project fostered networking and increased awareness of R&D players about their own opportunities especially to bring them together to join their efforts in research and development. Many FP7 proposals were initiated during our workshops or field-trainings. were initiated such as use of cloud computing (consumer programming) for the mission planning and report generation after the mission. Another development that originated in the laboratory was a simple identification method based upon self-oscillations that enabled identification of parameters for marine unmanned vehicles (underwater and surface) of non-linear mathematical model of the vehicle. This method is simple, affordable, easy to perform and fast. With this method it is easy to identify parameters of a mathematical model of a vehicle when sensor suite of the vehicle

change, which often happens during missions at sea. This method was detected by colleagues from NATO Undersea Research Centre and they offer us cooperation on their project dealing with mine-countermeasure with autonomous marine vehicles.

CURE was very successful in exploiting the potential for co-operation that exists among research groups in EU. The CURE team was invited to join as partner to around 10 FP7 project proposals of which four were successful.

The following projects were financed by EC:

1. FP7 (ICT STREP) project "Cognitive Autonomous Diver Buddy – CADDY" (GA611373), duration: 1.1.2014. - 31.12.2017.  
EC contribution: 3,7 mil. €. Coordinator: Assist. Prof. Nikola Mišković. [caddy-fp7.eu](http://caddy-fp7.eu)
2. ECHO - European Commission Directorate General Humanitarian Aid and Civil Protection project „Autonomous Underwater Vehicles Ready for Preparedness of Oil Spills - Urready4OS“ (ECHO/SUB/2013/661056), duration: 1.1.2014. - 31.12.2016.  
EC contribution: 434.228,00 €.
3. FP7 (research infrastructure) project "Towards and Alliance of European Research Fleets - EUROFLEETS2" (GA 312767), duration: 01.03.2013. - 28.02.2017.  
EC contribution 9 mil. €. [www.eurofleets.eu/hp4/63](http://www.eurofleets.eu/hp4/63)
4. FP7 (research for SMEs) project "Cooperative Autonomous Robotic Towing system" (CART), duration: 1.11.2011. - 30.8.2013.  
[cart.posidonia.com](http://cart.posidonia.com)

Namely, the CURE team was consulted and engaged in some projects/missions for state agencies such as State institute for nature protection, National park Kornati, Croatian Conservation institute, Croatian Navy and some others. Due to the fact that this kind of endeavour was the pilot one for this area of Europe, the experience and know-how that came as a consequence was very useful also to others who are planning to embark on a similar endeavour.

### Cooperation countries

Team of researchers involved in CURE project established good relations with the institutions from the region such as with the Institute of Marine Biology (Kotor, Montenegro), Regional Center for Divers Training and Underwater Demining (Bijela, Montenegro) and Harpha Sea Ltd (Koper, Slovenia). All dissemination activities are well presented at the CURE [cure.fer.hr](http://cure.fer.hr) , BtS [bts.fer.hr](http://bts.fer.hr) – Breaking the Surface and LABUST [labust.fer.hr](http://labust.fer.hr) - Laboratory for Underwater system and Technologies. The CURE team opted to compete on ERA to ensure that the most important impacts are sustainable in the long term.

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national

research and innovation systems and policies.

9. Promoted investment in European research infrastructures.

# Cyprus

## Name

'Fault-Adaptive Monitoring and Control of Complex Distributed Dynamical Systems' (FAULT-ADAPTIVE)

## Year/duration

01/04/2012 – 31/03/2018 (5 years)

## Website

[www.kios.ucy.ac.cy/fault-adaptive](http://www.kios.ucy.ac.cy/fault-adaptive)

## Results

The FAULT-ADAPTIVE project has developed crucial tools and design methodologies that facilitate early detection and accommodation of “small” faults or unexpected events, before they cause significant disruption or complete system failures in critical infrastructures. These results have attracted attention worldwide. Professor Polycarpou has been an invited keynote speaker at 20 international conferences during the last five years, reporting on the outcomes of his research. The project has led to key research collaborations with local and European critical infrastructures, including water utilities, transportation agencies and power systems operators. The KIOS Research Center had significant impact in elevating the research and innovation status of Cyprus and providing an inspiring environment for highly motivated young researchers to pursue successful careers in the high-tech arena. Since the KIOS Research Center was initiated, more than 150 young researchers had an opportunity to work in the Center.

Based on their research outcomes, some of these researchers have initiated start-up companies, which have created a culture of innovation and technological advancement. This is made even more vital since it happened in the midst of one of the worst economic crises in the recent history of Cyprus.

KIOS has also been a key driver for academic collaboration with industry, SMEs, as well as public service authorities and semi-governmental organizations. KIOS collaborates with a number of critical infrastructure agencies across Europe, to enable safe and efficient operation of critical infrastructures, helping them towards harmonization and adherence to regulations, standards and policy targets set at national and regional levels.

## Expected socio-economic impact

Overall, the prestigious ERC Advanced Grant FAULT-ADAPTIVE has upgraded the international research and innovation stature of Cyprus and serves as an example of how a highly dedicated team from a small country, can build a world-class research center that can compete at an international level and have high impact on the local and European knowledge-based economy.

## Description

The ERC Advanced Grant project FAULT-ADAPTIVE set out as a pioneering research project to design “smart” algorithms for real-time monitoring and enhancing the fault tolerance of critical infrastructures



such as power distribution systems, water systems and transportation networks. As urbanization continues to grow worldwide, the reliability, efficiency and sustainability of critical infrastructures, are of crucial importance in terms of quality of life and economic growth. When critical infrastructures fail, the consequences may be tremendous, in view of societal, health and economic aspects. The sheer scale of these infrastructures, the complexity of their networks, the interaction with internal and external perturbations, as well as the interdependencies between infrastructures, make the management of these resources strenuously challenging. Moreover, the safety and security of critical infrastructures against malicious attacks is becoming an issue of paramount importance for governments and businesses.

### **Cooperation countries**

N/A

### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
2. Promoted ground breaking research through a novel programme FP7 IDEAS (ERC).
3. Engaged industry and SMEs strategically.
10. Reached a critical mass of research across the European landscape and worldwide.

# Czech Republic

## Name

Euphresco Network - European Phytosanitary Research Coordination (Euphresco - FP6 and Euphresco II - FP7), initiated as an EU funded ERA-NET in 2006

## Year/duration

2006-2014

## website

[www.euphresco.net](http://www.euphresco.net)

## Results

Euphresco facilitated collaboration of national funders to support transnational research projects in phytosanitary research.

Euphresco network enabled better coordination of national programmes in phytosanitary research and ensured strategy for setting up priorities and avoiding overlaps among projects funded under different mechanisms.

From 2008 to 2014 Euphresco network:

- Co-ordinated national funds for a total budget of 32 M €. Five calls were organised and 47 research projects have been funded.
- Euphresco funded projects contributed to evaluation of factors determining distribution, impact, detection and characterization of harmful organisms and plant diseases and therefore contributed to the development of strategies for pest and disease control and integrated plant protection.
- Projects contributed to the analysis of risks of spreading pests and diseases under changing climate condition.

- Euphresco supported exchanges of research staff, sharing and exchanging research methodologies and materials.
- Ministry of Agriculture of the Czech Republic supported relevant important topics from the research programme of the Ministry. Based on experience gained in Euphresco follow-up research activities are funded from national sources.



## Expected socio-economic impact

- contribution to EU phytosanitary legislation (combating spreading of economically important harmful organisms and plant diseases),
- Euphresco network introduces innovative practical methods of phytosanitary control, more exact, reliable, sensitive and fast diagnostics methods and tools important in plant protection and contributes to their validation before introduction into practice.
- Partners involved in Euphresco funded research projects benefit from sharing financial resources, access to research facilities, information exchange and access to research results in order to solve important phytosanitary problems in EU.

## Description

Euphresco Phytosanitary ERA-Net was established in 2006, with the full support of the EU Council Working Party of Chief Officers of Plant Health Services. It aimed at better coordination of national, trans-national and EU-funded research

research in direct support of the CPHR (EU policy, inspection services and science capability). The Euphresco project ended in 2010; the new EUPHRESKO-II proposal project deepened and enlarged the previously successful cooperation between research programmes. EUPHRESKO-II strengthened the basis for and result in a self-sustainable, long-term, durable network; deepened the cooperation through continued trans-national research that optimises limited resources, supports other plant health initiatives and coordination mechanisms, and further develops a culture of collaboration; deepened the cooperation by improving processes and tools and reducing barriers.

#### Cooperation countries

Network has expanded from 23 partners in 17 countries (2006-2010) to 31 partners in 22 countries with 12 European observer countries and two international observers. Czech partner is the Ministry of Agriculture of the Czech Republic

#### FP7 Evaluation Achievements

- 1 Encouraged scientific excellence on individual and institutional level.
- 5 Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
- 6 Addressed certain societal challenges through research, technology and innovation.
- 7 Encouraged harmonisation of national research and innovation systems and policies.  
Stimulated mobility of researchers across Europe.

- 10 Reached a critical mass of research across the European landscape and worldwide.



#### Name

The development of novel drugs against HIV

#### Year/duration

Descartes prize 2001

#### Website

[ec.europa.eu/research/science-awards/pdf/6\\_years\\_descartes\\_en.pdf](http://ec.europa.eu/research/science-awards/pdf/6_years_descartes_en.pdf)

#### Results

Tenofovir is the most significant inhibitor of the viral reverse transcriptase.

- Synthesis of tenofovir (patent US 4808716) by prof. Antonín Holý (CZ)
- Discovery of antiviral potential of the tenofovir
- Confirmed antiviral tenofovir activity against HIV in cell culture
- Clinical studies proved that tenofovir exhibits anti-HIV effects in humans
- Awarded by Descartes prize for collaborative research aimed at development new drugs against HIV/AIDS infection
- In combination with different substances tenofovir is now used for treatment of different viral infections. The most significant tenofovir based drugs at the market are: Truvada, Viread, Atripla, Complera/Eviplera

#### Expected socio-economic impact

Since the year 2000, 38.1 million people have become infected with HIV and 25.3 million people have died of AIDS-related



illnesses, which proves the urgency for an effective HIV drug and the huge importance of the discovery of tenofovir. The tenofovir- based drugs in use:

Truvada™ (emtricitabine and tenofovir disoproxil fumarate) is likely the most effective anti HIV drug. The number of viral particles is below detectable value with 65% patients treated during the least five years by Truvada. Truvada is now used worldwide.

Viread™ (tenofovir disoproxil fumarate), the inhibitor of the HIV virus replication is now used in many countries, USA, EU, Japan etc. In 2008 it was approved also for treatment of chronic hepatitis B. More than 400 million people are estimated to be chronically infected with HBV worldwide and, without treatment, up to one quarter of those will ultimately die of liver disease.

### Description

Tenofovir is an antiviral drug which was initially synthesized (patent US 4808716) by Prof. Antonín Holý (1936 – 2012) at the Institute of Organic Chemistry and Biochemistry of the Academy of Sciences of the Czech Republic in Prague. Since 1976 Prof. Holý collaborated with Prof. Eric de Clercq from the Rega Institute (Belgium), who created European facility for HIV drugs screening with the support of the European Commission. The collaboration confirmed the antiviral potential of tenofovir, in 1985 Prof. De Clercq and Prof. Holý described the activity against HIV in cell culture. This led to investigation of tenofovir's potential as a treatment for HIV infected patients. In 1997 researchers from Gilead and the University of

California, San Francisco demonstrated that tenofovir exhibits anti-HIV effects in humans.

Later on Prof. Balzarini from the Rega Institute set up a consortium of teams from six countries (BE, CZ, ES, IT, SE, UK) with the aim to employ their expertise in complementary disciplines to combat the HIV/AIDS in the most comprehensive way. The co-operation led to the development of tenofovir, a new phosphonate nucleoside drug which is a specific reverse transcriptase inhibitor for the treatment of AIDS. This consortium won the Descartes prize in 2001. The drug was licensed to the US drug producer Gilead Sciences, Foster City, California. The US Food and Drug Administration approved it for clinical treatment of HIV-infected individuals in the USA in October 2001

### Cooperation countries

Belgium, Spain, Czech Republic, Sweden, UK, Italy.

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
2. Promoted ground breaking research through a novel programme FP7 IDEAS (ERC).
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.

6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national research and innovation systems and policies.
8. Stimulated mobility of researchers across Europe.
10. Reached a critical mass of research across the European landscape and worldwide.

# Denmark

## Name

Novel technology for High-PERformance Piezoelectric Actuators (HIPER-ACT)

## Year/duration

2008-2012 (4 years)

## Website

[www.hiperact.org](http://www.hiperact.org)

## Results

The HIPER-ACT project coordinated by Danish SME Noliac developed piezoelectric actuators which are components that convert electrical energy directly into mechanical energy and vice versa.

The researchers coming from nine companies and six research institutions enhanced and improved components making them more resistant to cracking and humidity, and ultimately leading to improved reliability.

The results were outlined in numerous reports and peer-reviewed publications, in addition to being disseminated at conferences, exhibitions and workshops. Moreover, the project identified four exploitable foregrounds and filed in one patent application. The results of the technological development have been commercialised by three of the participating SMEs

## Expected socio-economic impact

It is expected that the newly developed piezoelectric actuators will have a positive impact on industry, helping to create better, safer and more accurate devices,

vehicles and equipment in a variety of fields, e.g.

- Reducing the cost of energy produced by wind by 5 %
- Improving productivity and quality for wire bonding machines and enabling 3D-packaging of electronic equipment.
- Fuel savings in cars by 0.2 liters per 100 km.
- Creating new jobs in the European knowledge-based production sector.

## Description

Modern industry and manufacturing processes rely heavily on piezoelectric actuators – devices often used for ultra-precise positioning and to generate high forces or pressures. As equipment becomes more sophisticated and is required to work under a range of conditions, researchers are striving to develop actuators that work well under extreme environments, such as those characterised by high humidity and physical stress.

Such technology would be very useful in many applications, such as for wind turbines to lower the cost of wind-produced energy. It could also be used for improving productivity and quality for wire bonding machines and enabling the three-dimensional (3D) packaging of electronic equipment. Also important, more efficient piezoelectric actuators could bring additional fuel saving in cars. HIPER-ACT aimed to develop better actuators that could boost these applications and many others.



During the project, novel ceramic material compositions have been developed, production processes have been optimised and tests have shown superior performance. In parallel novel materials and methods for new internal electrodes have been developed and optimised with result of significantly reducing line width. Finally, piezo electric multilayer actuators based on the novel developed ceramic materials and electrodes have been designed, manufactured and successful integrated and evaluated in four Modern industry and manufacturing processes rely heavily on piezoelectric actuators – devices often used for ultra-precise positioning and to generate high forces or pressures. As equipment becomes more sophisticated and is required to work under a range of conditions, researchers are striving to develop actuators that work well under extreme environments, such as those characterised by high humidity and physical stress.

Such technology would be very useful in many applications, such as for wind turbines to lower the cost of wind-produced energy. It could also be used for improving productivity and quality for wire bonding machines and enabling the three-dimensional (3D) packaging of electronic equipment. Also important, more efficient piezoelectric actuators could bring additional fuel saving in cars. HIPER-ACT aimed to develop better actuators that could boost these applications and many others.

During the project, novel ceramic material compositions have been developed, production processes have been optimised and tests have shown superior performance. In parallel novel materials and methods for new internal electrodes have

been developed and optimised with result of significantly reducing line width. Finally, piezo electric multilayer actuators based on the novel developed ceramic materials and electrodes have been designed, manufactured and successful integrated and evaluated in four

#### **Cooperation countries**

Denmark, Slovenia, Switzerland, Germany, United Kingdom, Czech Republic

#### **FP7 Evaluation Achievements**

1. Engaged industry and SMEs strategically.
2. Reinforced a new mode of collaboration and an open innovation framework.
3. Addressed certain societal challenges through research, technology and innovation.

# ESTONIA

## Name

Expose capacity of the Estonian Space Research and Technology through High Quality Partnership in Europe (ESTSPACE)

## Year/ duration

2008-2011

## Website

[www.to.ee](http://www.to.ee)

## Results

The main outcome of ESTSPACE project was the elaboration of the scientific priorities for Tartu Observatory for the period of 2011-2015, which were introduced to the European and Estonian scientific community, policy makers, media and general public at the end of the project in February 2011. ESTSPACE successfully developed a strategic research agenda for Tartu Observatory. Priorities are focused on astronomy, Earth Observation (EO) and space technology building on the Observatory's internationally recognised competence in remote sensing of the natural environment.

## Expected socio-economic impact

1. *Increased international collaboration, new updated research infrastructure and complementary competence of researchers has led to broadened research topics* - studies in the modern physics of astroparticles, applications for water remote sensing, development of specific space technology. Twinning workgroups and collaboration has been formed with key partners in excellent research and industry partners in Europe (list below) and via international networks, e.g. Eusaar, Aeronet, NordBaltSat, NorAquaRemS.
2. *Extended sources of financing.* ESTSPACE has motivated researchers to actively prepare proposals at highest quality in international level. Tartu Observatory had five more successful projects from FP7 and one Horizon 2020 project. Synergies at national level in the field of space technology and remote sensing has increased via joint activities.
3. *Awareness-raising about space research and technology, new ideas and information about European space research and technology.* Exposure of Estonian space research and culture to the ERA. Including numerous outreach activities for general public (design of exhibitions: for example "A living universe") and schoolchildren



<sup>1</sup> Strategic partnership for improved basin-scale water quality parameter retrieval from optical signature' (WATERS), 'Electric solar sail technology' (ESAIL), 'Utilizing the potential of NANOSATellites for the implementation of European Space Policy and space innovation' (NANOSAT), 'FORest management strategies to enhance the MITigation potential of European forests' (FORMIT), 'Global Lakes Sentinel Services' (GLASS)

<sup>2</sup> MULTIscale SENTINEL land surface information retrieval PLatform (MULTIPLY)

<sup>3</sup> [www.teletorn.ee/en/event-calendar/fcalrepeat.detail/2015/11/18/566/49/1811-3103-a-new-exhibition-a-living-universe-](http://www.teletorn.ee/en/event-calendar/fcalrepeat.detail/2015/11/18/566/49/1811-3103-a-new-exhibition-a-living-universe-)

(active learning programs for secondary school students and teacher continuous professional development courses) with the establishment of Tartu Observatory's visitors centre.

4. *Estonian space research and technology capacity has been acknowledged by European Space Agency (ESA) and Estonian government.* In 2010, the Plan for European Cooperating State was signed and 12 cooperation projects started the next year. Tartu Observatory is carrying out six contracts with European Space Agency in cooperation with enterprises .

#### **Description**

Project ESTSPACE started in 2008 with the general objective to enhance the potential and research capacities of Estonian scientists in space and atmospheric research, space technology and remote sensing by supporting and mobilising human and material resources and developing strategic partnerships with other research groups in Europe. The partnership enables better focusing of future research efforts, support closer cooperation of Estonia with ESA and facilitate the participation of Estonian scientists in Global Monitoring for Environment and Security (GMES) programme and most relevant activities in European Research Area (ERA) as well as in global space community.

#### **Cooperation countries**

Spain, Sweden, Netherlands, UK, Italy, Finland.

#### **FP7 Evaluation Achievements**

- Strengthened and more inclusive/ integrated European Research Area by means of catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges
- Encouraged scientific excellence on individual and institutional level
- Promoted investment in European research infrastructure
- Strong positive image with general public for investments into research
- Next generation researcher training in natural sciences.

<sup>4</sup> 'Services based on optical radiometry applications for aquatic environment', 'Emission line star classification in the Gaia catalogue', 'Algorithms for mapping galactic structures with Gaia and Euclid' (AGE), 'QUALITY - Instrument for the volume scattering function of water', 'Increasing quality of above water spectral measurements in lakes/turbid waters' (S3VT), MERIS Validation and Algorithm 4th reprocessing - MERIS Validation Team (MVT)

# Finland

## Name

BONUS programme (Joint Baltic Sea research and development programme)

PROBALT project

## Year/duration

2008-2011

## Website

BONUS: [www.bonusportal.org](http://www.bonusportal.org)

PROBALT: [www.bonusportal.org/files/1609/PROBALT\\_Final\\_Report.pdf](http://www.bonusportal.org/files/1609/PROBALT_Final_Report.pdf)

## Results

The awareness of the problem of eutrophication, as well as national and sub-national aspirations and the ability to address eutrophication in national policies and strengthen policy implementation have not been affective enough and vary across the region. On the basis of the case studies conducted, PROBALT recommends that in order to improve Baltic Sea eutrophication governance, four sets of measures need to be urgently undertaken at various governance levels ranging from international to local.

1. A macro-regional, binding, cost-effective and fair agreement regarding the prevention of eutrophication
2. The spatial and temporal specification of policies/measures
3. The more effective and thorough integration of different policy sectors

4. Increasing publicity, environmental awareness and deliberative democracy (see [www.bonusportal.org/files/1609/PROBALT\\_Final\\_Report.pdf](http://www.bonusportal.org/files/1609/PROBALT_Final_Report.pdf))



## Expected socio-economic impact

PROBALT has also formulated a model for nutrition trading for the Baltic Sea countries. The project partners have also produced policy recommendations for overcoming obstacles to the effective protection of the Baltic Sea and raised the awareness about the state of the Baltic Sea in the individual countries by disseminating information about the PROBALT project, its research results and the problem of eutrophication in general in various forums; for example by organising journalist training and stakeholder seminars.

One central aim of FP7 was to contribute to sustainable development. PROBALT contributes explicitly to this aim. It also represents research that is fully compatible with the principles of Responsible Research and Innovation (RRI). While PROBALT is a fairly small EU project, as part of the “family” of the BONUS projects, its impact has been much wider.

## Description

BONUS is a research and development programme under the Article 185 focusing on the Baltic Sea environment and ecosystems. It is supported by the national research funding institutions in the eight EU member states around the Baltic Sea and the EU Research Framework

Programme. BONUS offers a strategic framework to support trans-disciplinary research that fills knowledge gaps, supports evidence-based policy, helps to refine management systems and strengthen practices to enable sustainable use of the Baltic Sea's ecosystem.

*PROBALT - Improving societal condition for the Baltic Sea protection* is a project funded by the BONUS programme under the 7th Framework Programme in 2008–2011. The project had four partners, one of which from Russia. The overall aim of PROBALT was to make the prevention of eutrophication, i.e. the process by which a body of water acquires a high concentration of nutrients, more effective by analysing the societal conditions for the effective protection of the Baltic Sea at national, regional (HELCOM) and European Union levels. PROBALT also examined nutrient trading as an instrument to more effectively combat eutrophication.

### Cooperation countries

Bonus programme: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Sweden.

Probalt project: Finland, Germany, Russia

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.

6. Addressed certain societal challenges through research, technology and innovation.
8. Stimulated mobility of researchers across Europe.
10. Reached a critical mass of research across the European landscape and worldwide.



# FINLAND/GERMANY

## Name

European Research Council (ERC)  
(and its proof of concept instrument)

## Year/duration

2007-2013

## Website

[erc.europa.eu](http://erc.europa.eu)

## Results

The greatest achievement of FP7 was the launch of the European Research Council (ERC), which provides funding for high quality research on a bottom up basis. By including frontier research funding within the Framework Programme it became possible to cover the entire innovation process and to acknowledge the important role of basic research for future innovations.

ERC has been set up and running effectively and in a short timeframe. ERC has been successful in attracting the best researchers to apply EU funding and has raised the visibility and attractiveness of European research. ERC funding has thus become a benchmark of high quality research for researchers themselves but also for their host institutions. Through ERC funding universities and research institutes have become active participants in EU calls.

And...

- Important scientific breakthroughs in all research fields

- In total, over 40,000 publications in top scientific journals (such as Nature and Science) derive from all projects funded by the ERC. 1/3 of all ERC grantees have published articles that rank the top 1% most highly cited publications worldwide
- Numerous ERC grantees won prestigious prizes: 5 Nobel Prizes, 3 Fields Medals, 5 Wolf Prize and more
- 11 EU Member States have set up national research councils since the creation of the ERC; 12 EU Member States have launched funding schemes inspired by the ERC structure

## Expected socio-economic impact

- In particular, the ERC early career grants have activated universities in the Member States to restructure and develop their research career structures.
- Furthermore, the Proof of Concept instrument, which was introduced towards the end of FP7 to complement the ERC calls, has succeeded in advancing significantly the usability of the research results, involving other actors and bridging collaboration between them. This kind of activity has significant long-term benefits for the European Research Area, since ERC grantees are, or will be, in key positions in European science and have an important role in breaking traditional boundaries.
- Training and developing a new generation of top scientists in Europe and nurturing their most creative ideas
- The ERC contributes to reversing the



brain-drain, making Europe a more attractive place for bright minds worldwide, for researchers coming from abroad and those returning to Europe

- The ERC stimulates research organizations to invest more in the support of promising new talents and ideas
- The ERC helps nurture science-based industry and to create a greater impetus for the establishment of research-based spin-offs
- The ERC provides a mechanism for investing rapidly in research targeted at new and emerging issues confronting society

### Description

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 is a success story of European research funding. Proudly inaugurated under German Presidency in 2007, the ERC is - after a very short time of existence - established as the benchmark for scientific excellence in Europe. By creating open and direct pan-European competition, it enables the best ideas and talent to be recognized. Its grant schemes and the high-level peer review system are highly valued by the whole scientific community. The continuation and stabilization of the ERC under Horizon 2020 was unanimously supported by all stakeholders. The competition which the ERC created on a European level is seen as a very positive impact also on the national systems. The ERC is now established as an important player in the European research landscape. In order to keep the high

reputation, the ERC needs to be supported with an adequate budget and retain its independent governance structure and its "excellence only" approach in the future.

### Cooperation countries

EU Member States and Associated Countries

FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
2. Promoted ground breaking research through a novel programme FP7 IDEAS (ERC).
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national research and innovation systems and policies
8. Stimulated mobility of researchers across Europe.
10. Reached a critical mass of research across the European landscape and worldwide



# FRANCE

## Name

ESFRI roadmap completion and implementation

## Year/duration

2002 to 2015 (14 years)

## Website

[ec.europa.eu/research/infrastructures/index\\_en.cfm?pg=esfri](http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri)

## Results

ESFRI

- generated added value for society, economy, human life and well being;
- fostered new knowledge production;
- created synergies with regional funds;
- attracted young talents from non EU-countries;
- resulted in industrial spinoffs in Europe;
- confirmed the worldwide leadership of Europe in advanced research infrastructures

## Description

ESFRI, the European Strategy Forum on Research Infrastructures, is a strategic instrument to develop the scientific integration of Europe and to strengthen its international outreach. The competitive and open access to high quality Research Infrastructures support and benchmark the quality of the activities of European scientists, and attract the best researchers from around the world.

The mission of ESFRI is to support a coherent and strategy-led approach to policy-making on research infrastructures

in Europe, and to facilitate multilateral initiatives leading to the better use and development of research infrastructures, at EU and international levels.



## Specific support from the Framework Program

As early as the beginning of the FP7, the implementation of the projects identified by ESFRI was the subject of a specific sub-program of € 130 million within the research infrastructure program (1755 M€). The program, structured in two parts - preparatory phases and implementation phases - allowed starting 44 ESFRI projects. It is currently followed by a specific sub-program – called “Development and long-term sustainability of new pan-European research infrastructures” – of over € 500M in the new H2020 program whose purpose is to bring these projects to a level of maturity such that they can be operated in a safe and sustainable way.

The main task of ESFRI is now to help the projects on the roadmap move towards final implementation, to keep Europe at the rapidly evolving forefront of science and technology, and to increase the capacity to meet the needs of the EU and World scientific community; much remains to be done: ESFRI looks forward to the challenging times ahead.

## Expected socio-economic impact

Socio-economic impacts depend on the nature and the purpose of each of the 48

projects identified by ESFRI within its roadmap which is regularly updated.

An important category of infrastructures is the e-Infrastructures. For example in the health field, they play an important role in reducing the development time for new effective drugs. And in doing so improving the quality of life and reducing the social costs of disease, it is necessary to identify markers of disease or biological parameters that allow accurate and early diagnosis of the disease and its progression. According to the latest estimates of EU, the cost of brain diseases in Europe in 2004 was €386 billion and the global prevalence of Alzheimer's disease is predicted to quadruple to €106 million by 2050. The neuGRID e-Infrastructure can process the world's largest Alzheimer's disease imaging database in ten days, instead of five years. That equates to approximately 6,500 brain MRI scans consisting of over 1.6 million images related to more than 700 patients with Alzheimer's disease and Mild Cognitive impairment. This is tremendously effective because the analysis that can be done today in neuGRID would require more than five years to be run on a single computer.

#### Cooperation countries

South Africa, Chile, Russia, India

#### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
2. Federated scattered facilities on all the European territory.
3. Engaged industry and SMEs to use research facilities
4. Reinforced a new mode of collaboration and an open innovation framework.

5. Strengthened the European Research Area by catalysing a culture of cooperation and construction of long term installations for the XXIth century challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged the harmonisation of national research policies.
8. Stimulated concertation of researchers across Europe.
9. Promoted investment in European research infrastructures.
10. Reached a critical mass of research infrastructures across the European landscape and worldwide



#### Name

MetaHIT Metagenomics of the Human Intestinal Tract

#### Year/duration

2008-2012 (four years)

#### Website

[www.metahit.eu](http://www.metahit.eu)

#### Results

MetaHIT was a front runner project, opening new fields in science, nutrition and medicine. The MetaHIT research project has led to :

#### The creation of one start-up : Enterome

Enterome is developing innovative therapeutic solutions in the new and promising field of diseases associated with abnormalities of the gut microbiome and that are as diverse as Crohn's disease, asthma, obesity, diabetes, multiple

sclerosis, and some forms of cancers.  
[www.enterome.fr](http://www.enterome.fr)

### **The Creation of a pre-industrial demonstration unit Metagenopolis**

A game changer for health, pharmaceutical and food industries, a promise to bring new discoveries to tomorrow's market, to join forces for the development of new products and components, prognostics and diagnostics, a great opportunity to contribute to improving human health and well-being. This platform is also a partner in other FP7 projects. The MetaHIT project helped the implementation of the International Human Microbiome Consortium and technology transfer.

See the many press releases in the national media, eg

[www.lemonde.fr/sciences/article/2012/03/23/flore-intestinale-le-cerveau-sous-influence\\_1674270\\_1650684.html](http://www.lemonde.fr/sciences/article/2012/03/23/flore-intestinale-le-cerveau-sous-influence_1674270_1650684.html)  
[www.metahit.eu/index.php?id=205](http://www.metahit.eu/index.php?id=205)

Besides, 2 major scientific publications resulted from the program :

- the MetaHIT research project has led to the creation of a catalogue of microbial genes sheltered by the intestine.
- the discovery of the distribution of the population into 3 distinct enterotypes, each characterized by a dominant bacterium: bacteroides, prevotella and rumenococcus.

### **Description**

The project objectives: *association of bacterial genes with human health and disease*

*The central objective of the project is to establish associations between the genes of the human intestinal microbiota and our health and disease.*

It focuses on two disorders of increasing importance in Europe, Inflammatory Bowel

Disease (IBD) and obesity. The incidence of IBD has been increasing constantly during the past decades in Western Europe, and this dramatic trend is now observed in Eastern Europe as well. The global epidemic of obesity is well recognized and imposes a huge and rapidly growing challenge for the public health services.

To reach the central objective, the project carried out and integrated a number of different activities. First, it established an extensive reference catalog of microbial genes present in the human intestine. Second, it developed bioinformatics tools to store, organize and interpret this piece of information. Third, it developed tools to determine which genes of the reference catalog are present in different individuals and at what frequency. Fourth, it gathered cohorts of individuals, some sick and some healthy, and determined for most which genes they carry. Fifth, it developed methods to study the function of bacterial genes associated with disease aiming to understand the underlying mechanisms and host/microbe interactions.

The project is integrated in the world we live in. For this purpose, it actively participates in the International Human Microbiome Consortium (IHMC), carries out transfer of technology to industry and helps present information about the project to the general public.

### **Expected socio-economic impact**

The impact of the project bears on three domains, the scientific community, the industry, and society.

Concerning *the scientific community*, the impact of the project can be analysed through the use of foreground generated

in further activities, and the analysis of necessary accompanying actions, such as the question of standards used by the community worldwide.

*In relation with industry*, its activities are translated into a measurable increase of the interest of industrial partners in the use of foreground (knowledge) generated, as well as applying the technological developments (know-how) to explore health and nutrition questions of foremost importance nowadays.

Finally, *the impact of its communication in general*, and towards the general public more specifically, was seen through the interest we perceived in communication through traditional media, such as general, non specialist press, as well national press : this forefront science topic which was very innovative at the beginning of FP7 is now a very popular subject. For example one of the best-seller book is now “Gut: The Inside Story of Our Body’s Most Underrated Organ” by Giulia Enders

6. Addressed certain societal challenges through research, technology and innovation.
9. Promoted investment in European research infrastructures.
10. Reached a critical mass of research across the European landscape and worldwide.

### Cooperation countries

France, Denmark, Germany, Spain, Italy, The Netherlands, The United-Kingdom, China

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.

# Germany

## Name

European & Developing Countries Clinical Trials Partnership (EDCTP)

## Year/duration

2003-2014 (FP6 and FP7, EDCTP-1),  
2014-2020 (Horizon 2020, EDCTP-2)

## Website

[www.edctp.org](http://www.edctp.org)

## Results

- Critical mass and capacity development for clinical trials (all phases) and related research in sub-Saharan Africa
- Fellowships/career development of individual researchers or clinical staff; Memorandum of Understanding with the European Federation of Pharmaceutical Industries and Associations (EFPIA) for clinical research fellowships with the collaboration of European-based pharmaceutical companies
- Strengthening the national regulatory environments (in cooperation with WHO)
- Collaboration/Synergies with other funders including Bill & Melinda Gates Foundation
- Triggered private investments from pharmaceutical companies and SMEs

## Expected socio-economic impact

- Reduction of the social and economic burden of poverty-related diseases (PRDs) and neglected infectious diseases (NIDs) in developing countries by means of

- New or improved drugs, vaccines, microbicides and diagnostics



## Description

The European & Developing Countries Clinical Trials Partnership (EDCTP) is a public-public partnership between countries in Europe and sub-Saharan Africa, and the European Union. It is the first of the measures established according to Art. 185 TFEU (ex Article 169 TEC) and was supported under FP6 and FP7 with about € 200 million EC contribution plus € 200 million from participating countries. EDCTP aims to support collaborative research that accelerates the clinical development of new or improved interventions to prevent or treat HIV/AIDS, tuberculosis, malaria and neglected infectious diseases in sub-Saharan Africa. Due to its success under previous FPs, the European Union will provide a contribution of up to € 683 million for the next 10-year programme (2014-2024), provided this is matched by contributions from the European Participating States. The EDCTP Association is the dedicated implementation structure for the second EDCTP programme (EDCTP2; 2014-2024). It was established under Dutch law to enable African countries directly to be involved as members in the government structure. This was not possible under FP6 and FP7, when EDCTP was still organized as a European Economic Interest Grouping (EEIG).



### Cooperation countries

- 14 European countries: Austria, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, UK
- 14 African countries: Burkina Faso, Cameroon, Congo, Gabon, The Gambia, Ghana, Mali, Mozambique, Niger, Senegal, South Africa, Tanzania, Uganda and Zambia

### FP7 Evaluation Achievements

Almost all; with a special emphasis on (in order of relevance):

6. Addressed certain societal challenges through research, technology and innovation.
10. Reached a critical mass of research across the European landscape and worldwide.
3. Engaged industry and SMEs strategically.
7. Encouraged harmonisation of national research and innovation systems and policies.
1. Encouraged scientific excellence on individual and institutional level

---

---

### Name

KIC InnoEnergy

### Year/duration

2010 / probably 15 years (and likely more after the funding period)

### Website

[www.kic-innoenergy.com](http://www.kic-innoenergy.com)

### Results

**Corporate:** 27 shareholders – top European players from industry, research, universi-

ties and business schools; 160 associate and project partners across Europe

**Business Creation:** 111 early start-ups supported; more than 20 million € of external investment raised; 1292 business ideas captured; 55 new companies created

**Innovation:** 24 solutions used by industry; 59 patents filed; 3 manufacturing facilities constructed; more than 160 companies involved in KIC activities; currently, over 70 innovation projects receive support from the KIC

**Education:** 8000 applicants to KIC InnoEnergy Master's school; 280 graduates; 93% of graduates find a job within 6 months of graduating; average annual salary earnings 15% above average of graduates of similar programmes; 6 PhD school tracks (Clean Coal, Energy from Chemical Fuels, Sustainable Nuclear & Renewable Energy Convergence, Sustainable Energy Systems for Renewables, Smart Cities, Smart Electric Grids and Storage)

### Expected socio-economic impact

Ever since its inception in 2010, KIC InnoEnergy has

- generated added value for society, economy and human life in all of its 8 thematic areas (see below);
- triggered considerable private investment;
- fostered new knowledge;
- attracted young talent (both at masters and PhD level);
- resulted in industrial spinoff in Europe;
- improved entrepreneurial thinking with students;
- and thus strengthened the European position in the field of energy research and innovation

## Description

KIC InnoEnergy is one of the first Knowledge and Innovation Communities (KICs) fostered by the European Institute of Innovation and Technology (EIT); it took up its operation in December 2010. Today, it is a commercial company with 27 shareholders that include top ranking industries, research centres and universities, all of which are key players in the energy field.

More than 150 additional partners contribute to the KIC's activities to form a first-class and dynamic network that is always open to new entrants and furthers the pursuit of excellence. Although KIC InnoEnergy is profit-oriented, it has a "not for dividend" financial strategy, reinvesting any profits it generates back into its activities.

KIC InnoEnergy is the European company dedicated to promoting innovation, entrepreneurship and education in the sustainable energy field by bringing together academics, businesses and research institutes (catalyst function). Its goal is to make a positive impact on sustainable energy in Europe. It does so by creating future game changers with a different mind-set, and bringing innovative products, services and successful companies to life.

- It provides acceleration services to start-ups and ventures by supporting entrepreneurs with their business ideas, strengthening their business models, building expert teams, and providing access to finance
- It supports innovation in the field and bring innovative ideas to life that have a positive impact on sustainable energy in Europe

- It provides Master's and PhD educational programmes that deliver knowledge and skills to students and managers that will shape the future of the energy sector.

KIC InnoEnergy's mission is to build a sustainable long-lasting operational framework amongst the three actors of the knowledge triangle in the energy sector: industry, research and higher education, and ensure that this integration of the three is more efficient and has a higher impact on innovation (talent, technology, companies) than the three standing alone. Its vision is to become the leading engine for innovation and entrepreneurship in sustainable energy.

The KIC's headquarters are based in the Netherlands, and the KIC's activities are developed across a network of offices located in Belgium, France, Germany, the Netherlands, Spain, Portugal, Poland and Sweden.

KIC InnoEnergy is committed to reducing costs in the energy value chain, increasing security and reducing CO<sub>2</sub> and other greenhouse gas emissions. To achieve this, the KIC focuses its activities around 8 technology areas:

- Clean Coal Technologies
- Energy from Chemical Fuels
- Energy Efficiency
- Electricity Storage
- Renewable Energies
- Smart and Efficient Buildings and Cities
- Sustainable Nuclear and Renewable Convergence
- Smart Electric Grid

### Cooperation countries

Belgium, France, the Netherlands, Poland, Portugal, Spain and Sweden (KIC office) in cooperation with numerous other countries with partners or representatives

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
8. Stimulated mobility of researchers across Europe.

# Greece

## Name

Love Food: Love Wave Fully Integrated Lab-on-chip Platform for Food Pathogen Detection.

## Year/duration

Start 01/09/2012 (42 months)

## Website

[love-food-project.eu/doku.php](http://love-food-project.eu/doku.php)

## Results

The project addresses the significant issue of *food safety* by proposing a novel technique for the efficient analysis of foodborne pathogen bacteria. Food-related outbreaks have a serious impact on consumers' health and trust to food-industry. With 48 million people suffering annually from foodborne diseases, several of which are hospitalized or even die, it is a *societal priority to strengthen food-safety management by developing and implementing more efficient methodologies to prevent such events*. Through the synergy of 7 partners and thanks to novel scientific and technological advancements produced within the project, new products have been developed in an integrated or modular format. These products will be brought to the market by the participating 2 industrial partners and 3 newly formed spin-offs, all of which will benefit by strengthening their innovation capacity, increasing their competitiveness and enlarging their portfolio of products and services. The engagement in the project of several young researchers and their continuous multidis-

ciplinary training in a field that merges biology with engineering is bringing added value by mentoring the future scientific/ industrial leaders for the benefit of human-targeted research.



## Expected socio-economic impact

The project proposes a paradigmatic change in food-analysis based on interdisciplinary and highly innovative research in order to confront the increasing emergence for faster, economical and more efficient food-pathogens detection. With over 270.000 companies, the food industry is the largest European manufacturing sector, providing employments to more than 4 million people and having an annual turnover of 956 billion euro. The proposed work is expected to have substantial impact in strengthening the competitiveness of Europe in the food and analytical sector while alleviating the societal burden related to food poisoning.

## Description

The Love-Food project is addressing the problem of food safety by surpassing laborious, lab-based and time consuming methods currently used by providing an innovative integrated, fast and cost-effective system for food analysis. Specifically, we have developed a fully autonomous analysis system for the detection of pathogens in food samples. To achieve this, bio, nano and micro technologies were converged in order to produce a *Lab-on-Chip* (LOC) diagnostic platform for sample pre-treatment, target (DNA)

amplification and analyte detection. The heart of the system is an acoustic wave sensor. A significant advantage associated with the above device lies in an innovative sensing approach, unique to acoustic systems, which is adopted for nucleic acid sensing. Additional incorporated innovations include the sample pretreatment modules, namely, a plastic nano-textured surface used for bacteria capturing and DNA extraction and a foil-based microPCR module for DNA amplification. All modules as well as the acoustic biochips can be fabricated using commercially micro engineering techniques, amenable to large scale production. Our new technology overcomes the main problems of current methods, by providing a time-to-response of less than 4hrs, as opposed to the currently required 2-3 days, and a simple, automated and portable system, as opposed to current labor-intensive and lab-based methods.

#### Cooperation countries

France, Germany, the Czech Republic.

#### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
6. Addressed certain societal challenges through research, technology and innovation.
8. Stimulated mobility of researchers across Europe.
10. Reached a critical mass of research across the European landscape and worldwide.

---



---

#### Name

NANOTHERAPY: a novel Nanocontainer drug carrier for targeted treatment of (prostate) cancer

#### Year/duration

2009-2014 ERC (Starting grant)  
2014 (18 months) ERC (Proof of Concept)

#### Website

[www.demokritos.gr/Contents.aspx?CatId=367](http://www.demokritos.gr/Contents.aspx?CatId=367)

or:

[www.must.risk-technologies.com/home.aspx?lan=230&tab=461&itm=461&pag=458](http://www.must.risk-technologies.com/home.aspx?lan=230&tab=461&itm=461&pag=458)

#### Results

- generated a drug delivery system that targets cancer and leaves the rest of the body untouched, “localized chemotherapy”;
- the ERC program supported 15 young scientists and the spinoff company in full development will support more than 100 scientists;
- the ERC PoC led to the development of a business plan, PCT and the establishment of the Nano4Chem ([www.nano4chem.com](http://www.nano4chem.com)) spinoff company at TEPA Lefkipos;
- we are about to carry out clinical studies Phase I at the University of Antwerp and ZeinCRO; to prove our technology works in humans;
- we collaborate with the GMP companies: DEMOS, Pharma Zag, MJR PharmaJet;
- a company was established under the assistance of SEV-Hellenic Federation of Enterprises;
- the commitment of the companies supporting this technology and

discussions with funds in Holland, Switzerland, Israel and Greece ensure synergy with international funds;

- nano4chem targeted DDS will reduce the public health care cost, will alleviate the side effects of the traditional chemotherapy reducing the pain of the traditional therapies;

### Expected socio-economic impact

Cancers are among the leading causes of morbidity and mortality in the world with approx. 14 million new cases and 8.2 million cancer-related deaths in 2012 (Source: World Cancer Report 2014). The total economic cost of cancer in Europe is EUR 126 billion (Source: Oxford University and King's College London, 2009) or EUR 102 per European with drugs representing 20% of the total. Cancer in Germany, France, Italy, and the UK together accounted for just over two-thirds of the cost.

It also costs us the people we love: 1.75 million died of cancer in Europe in 2012 (Source: Elsevier, European Journal of Cancer, 2013).

Patients who suffer from cancer need something potent to improve: on the one hand the tumour efficacy due to decreasing the unspecific release and on the other hand the drug toxicity. Our proposed drug nanocontainers will help pharma and biotech companies address this market gap, ultimately replacing Doxil® nanotherapy originating from India with a new European alternative, more stable and more effective.

### Description

NANOTHERAPY provided the solution to the problem "How can the delivered therapeutic dose to the tumour be increased while at the same time reducing

the dose in healthy tissue?"

This accomplishment leads to a huge improvement in the length and quality of life of cancer patients. In this context, NANOTHERAPY developed an innovative and patented therapeutic approach based on novel polymeric nanocarriers (NCs), which enables targeted drug delivery in tumors. Most investigational drugs fail due to unacceptable adverse effects and limited efficacy. Consequently, there is a pressing call for ways to elevate the efficiency of existing and developmental drugs to safely target tumors. The encapsulation of compounds in nanocarriers (NCs) has emerged as one of the most promising approaches to significantly improve local bioavailability. These NCs can protect oncology drugs against degradation and protect healthy tissues against toxic effects. Despite this promise, the number of nanocarrier-based treatments that have reached the market is still disappointing. The main problem in the development of these carriers is the requirement for stability and robustness when passing through the bloodstream, while being capable of unloading the drug when the target tissue has been reached. The NANOTHERAPY NC technology constitutes a significant improvement over the state of the art, since it is the first to integrate four stimuli (pH, temperature, reducing environments and alternating magnetic fields) as well as proprietary targeting capabilities. The "active targeting" aspect of our NCs results from the surface attachment of certain ligands that bind to proteins overexpressed on tumour cells. In mice experiments, our leading drug candidate NANO4-DOX (doxorubicin loaded in our NC platform) has proven significantly more safe and effective in vivo

than the current gold standard Doxil (liposomal doxorubicin), an absolute blockbuster nanomedicine in oncology. Our NCs are tunable products designed to give optimal control over the release kinetics and bioactivity of any anti-cancer compound, thereby improving pharmacotherapeutic efficacy and reducing side effects, resulting in a “best-in-class” clinical profile. There is strong clinical and industrial interest in nanomedicines – particularly in the field of oncology, as demonstrated by commercial sales of the first two nanomedicines for cancer treatment, liposomal Doxil and albumin-nanoparticle Abraxane (approximately USD \$600 million and \$649 million in peak worldwide sales respectively). The different needs of the pharmaceutical industry, medical professionals, patients, healthcare insurance companies and policy makers all play a part in driving the market for improved drug delivery of anticancer pharmaceuticals.

### Cooperation Countries

Netherlands, Portugal, Scandinavia, Germany, Switzerland, Poland, Italy, Finland, and Belgium.

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
2. Promoted ground breaking research through a novel programme FP7 IDEAS (ERC).
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of

cooperation and constructing comprehensive networks fit to address thematic challenges.

6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national research and innovation systems and policies.
8. Stimulated mobility of researchers across Europe.
9. Promoted investment in European research infrastructures.
10. Reached a critical mass of research across the European landscape and worldwide.

# Hungary

## Name

Integrated evolutionary analyses of genetic and drug interaction networks in yeast, (Network evolution)

## Year/duration

Start 2008-07-01 End 2013-06-30

## Website

[group.szbk.u-szeged.hu/sysbiol/pal-csaba-lab-index.html](http://group.szbk.u-szeged.hu/sysbiol/pal-csaba-lab-index.html) or  
[www.brc.hu/sysbiol](http://www.brc.hu/sysbiol)

## Results

The spread of the multi-drug resistant „super-pathogens” is a serious challenge for health industry. One of the main objectives of the research group is to find out the molecular mechanisms that influence antibiotic resistance. The research team employs laboratory evolutionary experiments along with new-generation, full genome sequencing and detailed biochemical analyses to decipher the general evolutionary mechanisms driving this process. The team systematically measured the sensitivity to other drugs that had become resistant to some specific compounds during the course of laboratory evolution. The research team observed a striking pattern: the bacteria that had become resistant to aminoglycosides, simultaneously displayed hypersensitive to several other classes of antibiotics. The research may help to develop complex drug combination therapies using a wide spectrum of antibiotics.

The Principal Investigator also organized meetings such as the EMBO Systems and Evolutionary Biology (SysE Bio) meeting in Barcelona 2015 and the Wellcome Trust Evolutionary System Biology meeting. The ERC grant also created synergies with national funds (Momentum program 2012). The PI has recently gained the ERC Consolidator Grant (2015-).



## Expected socio-economic impact

Several talented young scientists joined the lab and they received major international and scientific awards. Crucially, the research team popularized the research on antibiotic resistance in domestic and international media, and published research outcomes in top-ranked scientific journals.

## Description

The ability of cellular systems to adapt to genetic and environmental perturbations is a fundamental but poorly understood process both at the molecular and evolutionary level. There are both physiological and evolutionary reasonings why mutations often have limited impact on cellular growth. First, perturbations that hit one target often have no effect on the overall performance of a complex system (such as metabolic networks), as perturbations can be adjusted by reorganizing fluxes in metabolic networks, or changing regulation and expression of genes. Second, due to the fast evolvability of microbes, the effect of a perturbation can readily be alleviated by the evolution of



compensatory mutations at other sites of the network. Understanding the extent of intrinsic and evolved robustness in cellular systems demands integrated analyses that combine functional genomics and computational systems biology with microbial evolutionary experiments. In collaboration with several leading research teams in the field, we plan to investigate the following issues. First, we will ask how accurately genome-scale metabolic network models can predict the impact of genetic deletions and other non-heritable perturbations. Second, to understand how the impact of genetic and drug perturbations can be mitigated during evolution, we will pursue a large-scale lab evolutionary protocol, and compare the results with predictions of computational models. Our work may suggest avenues of research on the general rules of acquired drug resistance in microbes.

#### **Cooperation countries**

N/A

#### **FP7 Evaluation Achievements**

2. Promoted ground breaking research through a novel programme FP7 IDEAS (ERC).



# Iceland

## Name

FUTUREVOLC

## Year/duration

1/10/2012 (30 months)

## Website

[futurevolc.hi.is](http://futurevolc.hi.is)

## Results

- Establishment of a volcano geohazard supersite in Iceland, where land-based and space-based data on volcanoes and volcanic hazard can be accessed by scientists and stakeholders.
- Build-up of monitoring/research infrastructure in Iceland.
- Ability to track magma movements from deep in the earth, up through the volcano and into the atmosphere, and follow the dispersion of ash and gas with prevailing winds in the atmosphere.
- Improve determination of the eruption 'source term', i.e. the amount and velocity of material ejected into the atmosphere. The distribution of ash grain sizes, which determine how far the ash can travel. All these are input parameters into ash dispersion models that predict dispersion of ash from Icelandic volcanoes over the North Atlantic and to Europe.
- Establish a seamless chain of interaction and information flow from field observations to scientific community to stakeholders, like local hazard managers, local and international aviation authorities and the Emergency Response

Coordination Centre (ERCC).

- Establishes Icelandic institutions in the field of volcanology and volcano monitoring, in a leading role in H2020 projects.



## Expected socio-economic impact

- Strengthens monitoring of volcanic hazards from Icelandic volcanoes locally and internationally. Early eruption warnings can mitigate risk and economic losses to businesses like aviation, by allowing contingency plans to be put in place before the event occurs. Locally, it can allow protective measures to be taken to shield important infrastructures from floods (resulting from sub glacial eruptions), ash fall, lava flow, volcanic gas hazards to humans and livestock.
- Improves access for European hazard managers to information on volcanoes and volcanic hazards.
- Improves access for European scientists to volcanological data, enabling them to be more competitive internationally.

## Description

The main objectives of FUTUREVOLC are:

- To establish an integrated volcanological monitoring system through European collaboration,
- To develop new methods for evaluating volcanic crises, increase scientific understanding of magmatic processes,
- To improve delivery of relevant information to civil protection and authorities.

To reach these objectives, the project combines broad European expertise in seismology, volcano deformation, volcanic gas and geochemistry, infrasound, eruption monitoring, physical volcanology, satellite studies of plumes, meteorology, ash dispersal forecasting, and civil defence.

This European consortium leads the way for multi-national volcanological collaboration with the aim of mitigating the effects of major eruptions in Europe that may pose cross-border hazards. Iceland is selected as a laboratory supersite area for demonstration, both because of the relatively high rate of large eruptions with long ranging effects throughout Europe, and also because of Iceland's capability to produce the near full spectrum of volcano processes at its many different volcano types. Based on present monitoring networks and on-going research, the project will bridge gaps and combine efforts for a coherent close-to-real-time evaluation of the state of Icelandic volcanoes and their unrest. The project will provide timely information on magma movements from combined interpretation of earthquake sources relocated in three-dimensional velocity models, magma sources inferred from ground and space geodetic data, and measurements of volcanic volatiles. For better response during eruptions, the project will develop operational models of magma discharge rate, contributing directly to improved forecasts of ash dispersion. They will help to minimise economic disruption on a European scale during eruptions. By integrating a Volcanic Ash Advisory Centre and a civil protection unit into the project, European citizens will benefit directly from the scientific work of FutureVolc.

### **Cooperation countries**

Iceland, Ireland, United Kingdom, Italy, Norway, Germany, Sweden, France.

### **FP7 Evaluation Achievements**

The project has:

1. Encouraged scientific excellence on individual and institutional level.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
9. Promoted investment in European research infrastructures.

# IRELAND

## Name

Marie Curie Co-funding of regional, national and international programmes (COFUND)

## Year/Duration

2009- 2018

## Website

[www.iua.ie/irish-marie-curie-office/funding-calls/cofund](http://www.iua.ie/irish-marie-curie-office/funding-calls/cofund)

## Results

The eight COFUND awards secured by Ireland during FP7 provided individual fellowships for 225 researchers, who could freely choose their research topic and host organisation. Therefore the main outcome of these programmes is the career development of researchers who participated in them and the research that they performed during their fellowship.

Tracking of the careers of researchers who participated in the programmes which have concluded shows that they have achieved excellence in their research careers. Examples:

- Dr. Nora Khaldi, funded by the INSPIRE COFUND programme, has founded a company Nuritas, and was chosen to compete for Ireland in a TEDx event called “Made in Europe” organised by the European Union.
- Dr. Aiden Doherty, funded by the HRB COFUND programme, recently won one of three MSCA 2015 awards, presented by the European Commission in 2015.

- Dr. David Hoey, funded by the INSPIRE COFUND programme, received an ERC Starting Grant in 2012, and also received an MSCA 2015 award.



An additional and important result is the mainstreaming of the MCA best practices into national funding bodies.

## Expected socio-economic impact

Mobility and training of researchers has been highlighted in three of the Europe 2020 flagship initiatives:

1. Innovation 2020 highlights the importance of robust strategies to train researchers;
2. Agenda for New Skills and Jobs focuses on geographical mobility and providing the right mix of skills;
3. Youth on the Move supports transnational learning and employment mobility for young people.

The researchers supported by these programmes had the opportunity to benefit from a period of transnational mobility, strengthening their own careers and research profiles, but also creating research networks within Europe, and between Europe and the wider world. They were provided with excellent training to assist them with developing new skills and to set them on the path to building a sustainable career within the European Research Area. Finally, the research outputs from their fellowship projects, which span the entire range of research areas from social sciences and humanities to science,

technology and medicine, have contributed to enhancing and maximising European research excellence.

### Description

During FP7, six research funding and research performing organisations in Ireland were successful in securing eight large-scale awards from the Marie Curie COFUND action. The EU contribution, totalling almost €20 million, provided 40% of the funding for 225 mobile, early-career researchers to avail of a personal research fellowship involving transnational mobility.

The researchers could choose the research project they wished to work on and the most suitable host organisation for their fellowship. The transnational mobility was either into Ireland, or out of Ireland to a country of their choice with a fully-funded return phase to Ireland at the end of the fellowship.

The eight projects are:

- Energy 21, UCD ENERGY 21 International Training and Career Development Programme, operated by University College Dublin.
- ASSISTID, Assistive Technologies in Autism and Intellectual Disability, operated by Respect (charitable organisation financed by the Daughters of Charity).
- ELEVATE, Irish Research Council International Career Development Fellowships, operated by the Irish Research Council.
- Starting Investigator Research Grant, operated by Science Foundation Ireland.
- CARA Postdoctoral Mobility Fellowships in the Humanities and Social Sciences, operated by the Irish Research Council.

- INSPIRE, IRCSET International Mobility Fellowships in Science Engineering And Technology, operated by the Irish Research Council.
- The NBIPI Career Enhancement Mobility Programme, operated by the National Biophotonics Imaging Platform, managed by the Royal College of Surgeons in Ireland.
- HRB/Marie Curie Post-Doctoral Mobility Fellowship Scheme, operated by the Health Research Board.

Five of these programmes have concluded, with fellowships under the remaining three (UCD ENERGY 21, ASSISTID and ELEVATE) continuing until 2018. Two of the programmes are highlighted below:

#### INSPIRE<sup>5</sup> (concluded)

The “IRCSET-Marie Curie International Mobility Fellowships in Science, Engineering and Technology” programme funded 50 individual fellowships via two Calls for funding. Fellows selected some of the world’s most prestigious research institutions, including the University of Oxford, Massachusetts Institute of Technology and the Max Planck Institute for the initial outgoing phase of the award and subsequently returned to Ireland to finish their projects.

#### ASSISTID<sup>6</sup> (continuing)

The Assistive Technologies in Autism and Intellectual Disability programme will fund 40 individual fellowships aiming to equip postdoctoral researchers with multidisciplinary skills to enable them assume leadership roles in intellectual disability research and with the Services which

<sup>5</sup> [cordis.europa.eu/result/rcn/163881\\_en.html](https://cordis.europa.eu/result/rcn/163881_en.html)

<sup>6</sup> [cordis.europa.eu/project/rcn/188619\\_en.html](https://cordis.europa.eu/project/rcn/188619_en.html)

provide for the education, social inclusion and employment of people with autism or an intellectual disability. ASSISTID is the first example of charity funds being used to match the 40% EU contribution in a COFUND programme.

#### **Cooperation Countries**

UK and USA are formally associated to the DOCTRID collaborative research institute.

#### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
7. Encouraged harmonisation of national research and innovation systems and policies.
8. Stimulated mobility of researchers across Europe.

# Israel

## Name

ROBOCAST

## Year/duration

01/01/2008 – 31/12/2010

## Website

[www.robocast.eu](http://www.robocast.eu)

## Results

The ROBOCAST project:

- Evolution in medical instrumentation: providing a significant pool of skills, techniques and components to incorporate robotic and cognitive science technologies into various medical products
- Breakthrough: enabling remote execution of surgical procedures using robotic assistants, providing a force-feedback and a haptic interface to direct the operation
- Improved treatment: enabling the development of effective diagnosis and preoperative planning for neurosurgery, in order to make treatment quicker, less invasive, and more effective
- New surgical tasks and products, which are currently impossible with today's technologies

Technological achievements:

- Developing intelligence augmentation (IA) techniques for task performance and effective human-machine interaction (path planning and negotiation, uncertainty management and intelligent interface).

- Providing robots with autonomy (management of failures, negotiation of path execution, optical sensor management).
- Reducing robot footprint saving accuracy by feedback control loop and sensor – robot – robot cooperation.
- Providing the system with modularity and flexibility characteristics to make it scalable and usable in different applications (surgical and industrial).



## Expected socio-economic impact

- Using the technology developed for the benefit of the European medical service community, as well as the patients in need of this kind of treatment.
- Using the technology developed for the benefit of European industries by providing them with the pool of skills, techniques and components to incorporate robotic and cognitive science technologies into their products, for creating an enhanced products.
- Improving the European competitiveness in the field of medical instrumentation.
- Positing Europe in the forefront of medical instrumentation technology development and making it independent upon foreign imports in a strategically vital technology.
- Fueling European industry to develop new hardware and software products following on the new technology developed.



## Description

The ROBOCAST project focuses on robot assisted keyhole neurosurgery, referring to a brain surgery performed through a very small hole in the skull called “burr hole”. The reduced dimensions for the performance of the procedure are the reason why it is called “keyhole neurosurgery”. Keyhole neurosurgery is carried out for several interventions, from endoscopy to biopsy and deep brain stimulation. Needles and catheters are inserted into the brain through the tiny hole for biopsy and therapy, including, among others, the tasks of blood/fluid sampling, tissue biopsy, cryogenic and electrolytic ablation, brachytherapy, deep brain stimulation (DBS), diagnostic imaging, and a number of other minimally invasive surgical procedures. Related pathologies are tumors, hydrocephalus, dystonia, essential tremor, Parkinson’s disease, Tourette syndrome, clinical depression, phantom limb pain, cluster headache and epilepsy. The ROBOCAST project developed a system assisting the surgeon during keyhole interventions on the brain. The system composed of a mechatronic device and an intelligence part. The mechatronic device consists of a robot holding the instruments for the surgeon and inserting them into the brain with a smooth and precise controlled autonomous movement. The trajectory will be defined by the intelligence of the ROBOCAST system and will be approved by the surgeon, which is and remains the responsible of the outcome, before the insertion of the surgical instruments.

## Cooperation countries

- Israel: Mazor Surgical Technologies Ltd, Faculty of Mechanical Engineering -

Technion, Israel Institute of Technology, Laboratory for CAS and Medical Image Processing - The Hebrew University of Jerusalem.

- Italy: Department of Electronics, Information Science, and Bioengineering - Politecnico di Milano, Department of Neurological and Vision Sciences - University of Verona, SIRSLab - Robotics and System Lab - University of Siena, CF Consulting - Finanziamenti Unione Europea S.r.l.
- United Kingdom: Department of Mechanical Engineering and the Institute of Biomedical Engineering - Imperial College, Prosurrgics Ltd.

## FP7 evaluation achievements

3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
6. Addressed certain societal challenges through research, technology and innovation.
9. Promoted investment in European research infrastructures.
10. Reached a critical mass of research across the European landscape and worldwide.

# Latvia

## Name

FP7-REGPOT - Specific Programme  
“Capacities”: Research potential of  
Convergence Regions

## Year/duration

Project implementation 2008-2017, project  
duration 3,5 years

## Website

[cordis.europa.eu/programme/rcn/886\\_en.html](http://cordis.europa.eu/programme/rcn/886_en.html)

[cordis.europa.eu/projects/result\\_en?q=/result/relation/categories/resultCategory/code%3D%27report%27%20AND%20programme/pga%3D%27FP7-REGPOT%27](http://cordis.europa.eu/projects/result_en?q=/result/relation/categories/resultCategory/code%3D%27report%27%20AND%20programme/pga%3D%27FP7-REGPOT%27)

## Results

Latvian institutions implemented 5 projects in the areas of agriculture, medicine, pharmacy and photonics. Projects strengthened research potential by providing support in the form of investment, staff, networking and advice, promoted international cooperation and fostered better collaboration between research organizations, industry and end users.

## Expected socio-economic impact

Taking advantage of the knowledge and experience existing in other regions of Europe, actions under this heading helped to fully realise the European Research Area and to identify opportunities for boosting the regional commercialisation of research and development in collaboration with industry.

## Description

The benefit for researchers:

*The research community* was supported through:

- Transnational two-way exchanges of research staff between selected organizations in the convergence region, and one or more partner organizations;
- Support of existing centre of excellence for the recruitment of incoming experienced researchers from other European countries;
- development of research equipment and the development of a material environment enabling the exploitation of the intellectual potential to be found in the selected centres of existing excellence in the convergence region;
- Organization of workshops and conferences to facilitate knowledge transfer; promotional activities as well as initiatives aiming at disseminating and transferring research results in other countries and international markets.
- “Evaluation facilities” through which any research Centre in the convergence region can obtain an international independent expert evaluation of the level of their overall research quality and infrastructures.

## Cooperation countries

See project information on

- [www.innovabalt.eu](http://www.innovabalt.eu) ;
- [www.kki.lv/index.php?lang=en&id=87](http://www.kki.lv/index.php?lang=en&id=87) ;
- [www.foodclusterinitiative.eu/participating-projects/baltfoodqual](http://www.foodclusterinitiative.eu/participating-projects/baltfoodqual) ;
- [www.baltinfect.lv/about-project](http://www.baltinfect.lv/about-project)



### FP7 Evaluation achievements

1. Encouraged scientific excellence on individual and institutional level.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
9. Promoted investment in European research infrastructures.

---

---

#### Name

ENABLE - European Gram Negative Antibacterial Engine

#### Year/duration

01/02/2014 – 31/01/2020

#### Website

[www.imi.europa.eu/content/enable](http://www.imi.europa.eu/content/enable)

#### Results

The aim of the project is to develop new antibiotics against Gram-negative pathogenic micro-organisms. ENABLE is one of three research projects supported through the programme „New medicines against pathogens” (New Drugs for Bad Bugs, ND4BB), in the framework of Joint technology initiatives/ IMI (Innovative medicines).

#### Expected socio-economic impact

Antimicrobial resistance (AMR) is a major public health threat. Infections caused by resistant bacteria are increasing and causing Europe to face soaring costs both in terms of lives and public health expenditure. Despite the strong need for new antimicrobials, very few new, effective

antibiotics have been brought to the market in the last decades. The ENABLE project, within IMI’s New Drugs for Bad Bugs programme, is working to advance the development of potential antibiotics against Gram-negative bacteria, such as Escherichia coli. The ultimate goal of the project is to develop attractive antimicrobial candidates for testing in the clinic, bringing the possibility of new antibiotics to treat Gram-negative infections one step closer to patients.

#### Description

The aim of the project is to develop new antibiotics against Gram-negative pathogenic micro-organisms. In order to achieve this goal the project will create the antibacterial drug discovery platform and will select the new drug candidates for 1st phase of clinical trials. The project aims till 2019 to develop and deliver at least one new antibacterial product candidate for 2nd phase clinical studies for the treatment of infections caused by micro-organisms Gram-negative.

#### Cooperation countries

Coordinator: GlaxoSmithKline Research and Development Ltd; in cooperation with Spain, United Kingdom, Belgium, Finland, Denmark, Poland, Sweden, Netherlands, Switzerland and France.

#### FP7 Evaluation achievements

3. Engaged industry and SMEs strategically.
6. Addressed certain societal challenges through research, technology and innovation.
10. Reached a critical mass of research across the European landscape and worldwide.

# Lithuania

## Name

APPOLO “Hub of Application Laboratories for Equipment Assessment in Laser Based Manufacturing“, FP7, Collaborative Project (CP) - Large-scale integrating project (IP), grant agreement No 609355

Call: FP7-2013-NMP-ICT-FoF “Factories of the Future” - 2013

Objective: FoF-ICT-2013.7.2 Equipment assessment for sensor and laser based applications

## Year/duration

start 01/09/2013 (48 months)

## Website

[www.appolo-fp7.eu](http://www.appolo-fp7.eu)

and

[www.appolohub.eu](http://www.appolohub.eu)

## Results

APPOLO project is still running in its third year, however the project:

- generated added value for society, economy, human life: As project concentrated more on production tools and technologies, direct impact to human life can be expected only though consumer products made using those technologies or tool. New job were created and their number increases, showing direct impact to health of the companies involved in the project;
- triggered private investment and fostered new knowledge: Industrial partners invest to new infrastructure (new factory at Next Scan Technologies ,

Belgium, Research laboratories at EKSPLA UAB, LT). ;

- created synergies with regional funds: Partners – research institutions are using for assessment service the equipment ;
- attracted young talent: PhD students and master/bachelor students are working directly in the project;
- resulted in industrial spinoff in Europe: Partners- SMRE, like ELAS UAB in LT and Lightmotif BV in NL are spin-off from research centre and university, established before the APPOLO project and the project helps them to establish business niche and validate their product. One Spin-off is established from the project results in Spain, University Politecnica Madrid.



## Expected socio-economic impact

Opportunities for SME in the project to expend their business to new markets, making more interesting and well-paid jobs, increased turnover for all industrial partners

## Description

The project aiming to help innovative SME to enter industrial market by assessment and validation their new product (equipment) for laser-based manufacturing in close to industrial environment for the processes selected by end-user companies interested in the laser technology.

The APPOLO project has established and coordinates connections between the end-users, which have demand on laser technologies for (micro)fabrication,

knowledge accumulated in the application laboratories of research institutes and universities and the laser equipment manufacturers (preferable SMEs: for integration, lasers, beam control and guiding, software, etc.) in order to facilitate faster validation of the process feasibility and adaptation or customization of the technology (equipment) for manufacturing conditions, including reliability of components and their interaction as well as assessment of the dedicated production processes in terms of the process speed, quality and repeatability. Core of the consortium consist of laser application laboratories around Europe which are connected to a virtual hub to accumulate knowledge and infrastructure and promote the easy-to-access environment for development and validation of laser-based technologies. All partners selected a few directions (clusters) for validation of novel laser technologies, including equipment: the ultra-short pulse laser scribing for monolithic interconnects in CIGS solar cells: from laser to pilot line; use of lasers in smart surface texturing for automotive and printing/decoration industries and for flexible electronics. Innovative SMEs are related to large system-integrators and end-users through the application laboratories. Additional 14 industrial partners were selected through open competitive call.

Now project activities cover broad range of applications: automotive, electronics, photovoltaics, printing and decoration, machinery.

Research centre from Lithuania coordinates the projects, two local companies with global business are also the partners

#### **Cooperation countries**

Germany, Belgium, the Netherlands, Switzerland, Spain, Italy, Israel; Finland, Greece.

There are 36 partners in the project dominated by industry with only 6 partners being public research entities

#### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
10. Reached a critical mass of research across the European landscape and worldwide.



#### **Name**

Strengthening and Sustaining the European Perspectives of Molecular Biotechnology in Lithuania” (Programme: Research Potential (RegPot)

#### **Year/duration**

2009, 48 months

#### **Website**

[www.mobili.ibt.lt](http://www.mobili.ibt.lt)

## Results

The project:

- stimulated exchange of know-how and experience of researchers;
- contributed to recruitment of incoming experienced researchers and further attracted young talent from abroad;
- promoted investment in European research infrastructures;
- encouraged scientific excellence on individual and institutional level;
- increased international visibility.

## Expected socio-economic impact

Regarding the MoBiLi project contribution to the Regional Development, the MoBiLi project has contributed to improve the research capacity in biotechnology (human capacity and research infrastructures) of Lithuania and helped the launching of new biotech spin-offs and both activities can contribute to the future Lithuanian economic and social development.

## Description

The MoBiLi project was one of the three Lithuanian projects financed by European Commission under the Research Potential (RegPot) programme. The project was implemented by the Institute of Biotechnology Vilnius University (IBT; formerly the Institute of Biotechnology), one of the leading research institutions in Lithuania specialized on molecular biotechnology. The major objectives of the MoBiLi project were i) Human capital building for research in biotechnology; ii) Networking of IBT with major centres of excellence in the EU via joint research and mobility of researchers and iii) Upgrading of the Institute research infrastructure in line with emerging thematic priorities in the field.

The main outputs and outcomes obtained due to the project have been the following:

- The MoBiLi project has improved the IBT research capabilities and has helped to, increase its research quality and recognition.
- The project has contributed to improve the research capacity in biotechnology (human capacity and research infrastructures) of Lithuania and to help the launching of new biotech spin-offs and both activities can contribute to the future Lithuanian economic and social development.
- The project has contributed to increase the participation of IBT in the FP7. Regarding the expectations for the Horizon 2020, the increase of the number of “high quality” researchers and of the awareness of IBT by EU high level research institutions due to the MoBiLi project, should be able to help to increase the IBT competitiveness in that programme.
- Regarding sustainability of the research activities promoted by the MoBiLi project, the project coordinator has indicated that these activities are expected to continue.

Most of the IBT Weaknesses identified in the SWOT analysis elaborated when preparing the proposal have been clearly improved thanks to the MoBiLi project. Together with this, some of the IBT Threats also identified in the SWOT have been also diminished due to the project

## Cooperation countries

Germany, United Kingdom, France, Sweden, Switzerland, Austria, Denmark, Poland, Finland, Portugal

### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national research and innovation systems and policies.
8. Stimulated mobility of researchers across Europe.
9. Promoted investment in European research infrastructures.

# Luxembourg

## Name

LORRY:

Development of an innovative low rolling resistance truck tyre concept in combination with a full scale simulation tool box for tyre performance in function of road parameters.

## Year/Duration

November 2012 - October 2015 (36 months)

## Website

[www.lorryproject.eu](http://www.lorryproject.eu)  
[cordis.europa.eu/project/rcn/105867\\_en.html](http://cordis.europa.eu/project/rcn/105867_en.html)

## Results

LORRY is an innovative project in that it actively promoted the EU objective of a holistic approach to rolling resistance for an intelligent transport system and optimising truck fuel consumption by relating it to tire pressure, load, driving style and road and weather conditions. New tyres developed in the framework of LORRY show an improvement of 18% minimum in rolling resistance.

Furthermore it reduces carbon footprint and contributes to greener, safer and more efficient mobility in freight transport.

The project also contributes to a number of EU policy objectives including the European Commission Innovation Union initiative promoting more sustainable behaviour.

And perhaps more fundamentally, LORRY

proves the importance of thinking far beyond state-of-the-art and existing limits to reduce the automotive industry's carbon footprint, and illustrates the way forward in bringing road transport into the future.

## Expected socio-economic impact

LORRY allows all actors of the transport supply chain to benefit from it; the transportation sector benefits from the inherent safety/logistics benefits and save costs through fuel/longevity efficiency; and fleet operators/truck manufacturers are able to equip their trucks and trailers with environmental policy compliant tires, set future standards and save money.

In parallel, the tyre price will be maintained at the market level thanks to the parallel weight reduction measures, providing tyres users with important competitive advantages.

LORRY will fully establish the interaction of road parameters with parameters of tyre/material design relating it as well to fuel consumption. It will give an overview of tyre behaviour over a broad range of type of driving and environmental parameters across Europe reducing the future need for time consuming and expensive road test campaigns.

Enabling experimental and virtual methodologies also enhances the fundamental understanding, bridge knowledge gaps between material and tyre design scales.





### **Description**

The proposed concept goes beyond current state of art and stakeholder or market expectations regarding tyre rolling resistance, mileage, driving safety, driving performance and material and manufacturing sustainability. Steer and trailer tyres developed in the framework of the project demonstrate a minimum 20% gain in truck tyre rolling resistance. Truck tyre wear and wet safety performance levels will be improved additionally. To reach this objective, a multidisciplinary consortium (7 public / 4 private partners) has been created covering the fields of tyre technology, rubber and filler technology, nanotechnologies, composite physics, sensory, transport and road infrastructure. A complete set of complementary scientific evaluation methods enabled the understanding of interactions between new tread pattern design and new material composites as well as the tyre performance dependency on tyre-vehicle operation and road conditions. New tyre and truck fleet operating concepts resulting from the programme go beyond the European Green Car Initiative roadmap expectations for 2015 and smoothly bridge and feed next coming tailored trucks and sustainable trucks initiatives, forecasted respectively for 2020 and 2025.

Total cost: € 3 622 352,8, of which EU contribution: € 2 392 547.

Project reference 314463

### **Cooperative countries**

Luxembourg (Coordinator), Finland, Germany, France, Spain, Belgium, Netherlands (PPP).

### **FP7 evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
6. Addressed certain societal challenges through research, technology and innovation.

# MALTA

## Country

Malta

## Name

FP7 Specific Programmes – “Capacities” – Research for the Benefit of SMEs

## Year/duration

2007 – 2013

## Website

[cordis.europa.eu/programme/rcn/862\\_en.html](http://cordis.europa.eu/programme/rcn/862_en.html)

## Results

The main aims for this part of the FP7 Capacities Programme was to promote and support innovative SMEs with little or no research capacity themselves, but who were looking for new markets, new business partners and possibilities to extend their knowledge-base through R&D and innovation. Research performing SMEs who needed to complement their core research activities through outsourcing were also targeted.

Through this support, participating SMEs became more competitive and their capacity to collaborate with the ‘research community’ was enhanced, forging closer industry-academia links. A strong emphasis was indeed placed on the economic impact of the results achieved in the funded projects. The economic ‘benefit for the SMEs’ was crucial in such projects.

## Expected socio-economic impact

### Benefit for citizens:

A close working relationship between industry and the research community brought increased value to the European economy, higher growth and more job opportunities.

### Benefit for researchers:

Under FP7, SMEs strengthened their overall position through networking and relationship-building with international partners, access to research centres of excellence, and development of research and innovation.

### Benefit for industry and SMEs:

The proposed rules for Participation in FP7 specified a funding rate of 75% for research and development activities of SMEs, rather than the 50% currently applicable in FP6. This made it more attractive for SMEs to participate in the Framework Programme by lowering their financial burden.

### Description

The objective of the ‘Research for the benefit of SMEs’ Programme was to “strengthen the innovation capacity of European SMEs and their contribution to the development of new technology-based products and markets by helping them outsource research, increase their research efforts, extend their networks, better exploit research results and acquire technological know-how, bridging the gap in the innovation chain from idea to market through European level collaboration.”



Actions were encouraged *across the entire field of science and technology*, utilising a bottom-up approach. Two main types of activities constituted the core of the programme:

- (i) Research for SMEs: to support small groups of innovative SMEs in solving common or complementary technological problems.
- Research for SME associations: to support SME associations and SME groupings in developing solutions to problems common to large numbers of SMEs in specific sectors.

#### Cooperation countries

N/A

#### FP7 Evaluation Achievements

3. Reinforced a new mode of collaboration and an open innovation framework.
4. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.

---

---

#### Name

SELFDOTT- “From capture based to SELF-sustained aquaculture and Domestication Of blue fin tuna, *Thunnus thynnus*”

#### Year/Duration

2008 - 2011

#### Website

[sites.google.com/site/selfdottpublic/project-wps](https://sites.google.com/site/selfdottpublic/project-wps)

#### Results

The main goal for this research project was to develop the sustainable aquaculture of Bluefin Tuna (BFT) through a collaboration that bridged both research and industry stakeholders. Presently, tuna is caught and fattened in large pens offshore, which means the industry is totally dependent on stocks caught in the wild. The pressure on the Mediterranean stocks has put the fish on the endangered list. This project was a true game changer in that it shed light on the possibility to breed tuna in captivity.

In 2010, the SELFDOTT project managed to obtain a viable mass of eggs from BFT in captivity, using natural means and without any hormonal induction. This was the first time this had been achieved. It was an important step forward given the potential for the development of commercial breeding of the BFT in captivity to relieve the pressure on wild stocks of the fish.

The eggs were held in Spain and Malta, where the embryonic and larval development stages were studied to enable improvements in the survival and growth of the juveniles. The project also aimed to develop sustainable feeds for BFT juveniles and to produce a protocol for commercial-scale larval rearing.

#### Expected socio-economic impact

The following are some of the most important socio-economic impacts of the project:

- Helping the conservation of wild stocks by meeting some of the global demand for BFT;
- Ensuring consumers are more aware of the type of fish they consume

- Reducing the need to import raw fish for the fattening industry
  - Enhancing the existing knowledge on the reproductive biology and artificial spawning-induction of BFT
3. Engaged Industry and SMEs in a strategic manner
  4. Reinforced a new mode of collaboration and an open innovation framework
  5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges

The then EU Research, Innovation and Science Commissioner Maire Geoghegan-Quinn said the project was another example of EU-funded research contributing to tackling the most important global challenges today. She is quoted as saying: “If the results of this research can ultimately be commercialised, it can improve food supplies and contribute to economic growth and employment while also helping to ensure a sustainable management of bluefin tuna.”

### Description

SELFDOTT was launched in January 2008 and was funded under the FP7 Cooperation Work Programme: Food, Agriculture and Fisheries, and Biotechnology. The project was established to breed BFT in captivity and provide the basis for future ecologically-sustainable aquaculture of this threatened species. A pressing need for this exists due to the ever-increasing demand for BFT by the sashimi-sushi market, and hence, the threat of extinction of the species due to overfishing.

### Cooperation countries

The project was coordinated by the IEO, Instituto Español de Oceanografía (Spain), with partners from Malta, Greece, France, Germany, Israel, Spain, Italy and Norway.

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level

# The Netherlands

## Name

Fusions: Food Use for Social Innovation by Optimising waste prevention Strategies

## Year

2012 (4 years)

## Website

[www.eu-fusions.org](http://www.eu-fusions.org)

## Results

Partners began by defining food waste and developed a technical framework to monitor flows in the food system.

Researchers suggested methods for standardising the ways in which food waste data are collected, analysed and utilised across the EU. They identified the drivers and causes of food waste and mechanisms for reducing it.

A European multi-stakeholder platform was set up comprising more than 185 members from leading European organisations and aims at exchanging ideas and making recommendations for food waste reduction.

Project members mapped and analysed existing legislation and policies that impact food waste in Member States, and evaluated current food waste trends. A report on how to stimulate social innovation through policy measures has been drafted.

Through the delivery of seven feasibility studies, FUSIONS demonstrates the impact

of social innovation in preventing food waste, their up-scaling potential, and connection to the policy and governmental measures that are enabling change. In 2015 FUSIONS engaged with networks of social innovation entrepreneurs to encourage replication and to facilitate new business development.



## Expected socio-economic impact

- Improved co-ordination of the monitoring activities by the Member States on food wastage and its social and environmental impacts;
- Standardised data collection among Member States allowing EUROSTAT to report consistent data on food waste;
- Improved food waste management strategies;
- Improved food waste reporting requirements at EU and Member state level, enabling policy initiatives aiming at coherent food safety and hygiene regulation, food labelling (best-before date), food distribution, and awareness and educations campaigns to all players involved
- Use of best-practice social innovations to reduce food waste, proven by feasibility studies;
- On-going and connected national and European multi-stakeholder platforms; and
- A greater integration of research actors and activities from across the European Union, and the candidate countries.

### Description

Food waste is an issue of importance to global food security and good environmental governance, directly linked with environmental (e.g. energy, climate change, availability of resources), economic (e.g. resource efficiency, price volatility, increasing costs, consumption, waste management, commodity markets, consumption) and social (e.g. health, equality) impacts. Up to 1/3 – 1/2 of the world food production is not consumed, leading to negative impacts throughout the food supply chain and households. There is a pressing need to prevent and reduce food waste to make the transition to a resource efficient Europe.

FUSIONS (Food Use for Social Innovation by Optimising waste prevention Strategies) will contribute to achieving a Resource Efficient Europe by significantly reducing food waste. It will achieve this through a comprehensive and experienced European partnership covering all key actors across the food supply chain, including regulatory, business, NGOs and knowledge institutes, all with strong links to consumer organisations. FUSIONS will establish a tiered European multi-stakeholder Platform to generate a shared vision and strategy to prevent food loss and reduce food waste across the supply chain through social innovation: new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations.

The overall aim of the project is to contribute significantly to the harmonisation of food waste monitoring, feasibility of social innovative measures for opti-

mised food use in the food chain and the development of a Common Food Waste Policy for EU27. Utilising the policy and behavioural change recommendations from the delivery of the key objectives, the FUSIONS European multi-stakeholder platform will enable, encourage, engage and support key actors across Europe in delivering a 50% reduction in food waste and a 20% reduction in the food chains resource inputs by 2020.

### Cooperation countries

Finland, UK, Italy, Sweden, France, Norway, Denmark, Austria, Turkey, Hungary, Greece, Germany

### FP7 Evaluation Achievements

3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national research and innovation systems and policies.
10. Reached a critical mass of research across the European landscape and worldwide.

---

---

### Name

NEPHRON+

### Year

2010, 4-75 years

### Website

[www.nephronplus.eu](http://www.nephronplus.eu)

### Results

The project generated added value for society, economy and human life because

- It developed a wearable artificial kidney that (eventually)
- allows dialysis patients to lead a more full and active life
- adds another 10 to 16 years to their life expectancy.
- leads to a reduction of the risk for heart- and blood diseases
- will offer the patient more freedom and ability to participate in the society
- The project has reached a stage where commercial partners are ready to take the technology to the next stage, triggering private investments
- Cost savings in medical care in Europe are expected to reach €5-7 billion annually

### Expected socio-economic impact

- Reduced hospitalisation and improved disease management through more precise assessment of health status.
- Economic benefits for health systems and improved quality of care.
- New ICT-platform monitors patients (renal and others) continuously.
- Leadership Europe's eHealth: first ICT-platform for remote multiparametric monitoring of patients with chronic renal disease.

- Market opportunity: The market potential of the NEPHRON+ system amounts to €15 billion/year worldwide and €5 billion/year for Europe.
- Saving lives and Improving life condition: brings renal patients back into a normal social and working life, becoming productive again in the economic world.

### Description

End stage kidney disease is a global public health problem with an estimated 2.4 million patients on dialysis. The number of new cases is rising (7-8% annually) due to population ageing and increased diabetes prevalence. Without treatment kidney failure is deadly. Current treatment with a dialysis machine at home or in hospital is not ideal: it limits the patient's socio-economic activities and their life expectancy is reduced.

NEPHRON+ provided a major leap forward in renal care: The project experts developed a wearable artificial kidney for on-body blood purification - a next generation, integrated solution for personalized treatment and management of patients with chronic renal failure. The wearable, artificial kidney could be an ideal solution for continuous dialysis outside the hospital: It offers better treatment and better blood clearance, while patients can stay mobile and active in social and economic life.

The blood treatment can be adjusted to personal parameters and can be remotely controlled by clinical specialists: The system allows for real-time, continuous, multiparametric (tele) monitoring of both the patient and the device via innovative sensors. The continuous data collection allows for early detection of anomalies and

trend analysis on the health status of the patient, offering learning curves for improved treatment.

Cost savings in medical care are expected to reach €15.000-20.000/patient/year.

With 340.000 patients in Europe this implies an annual saving of €5-7 billion.

Most importantly, the patient can now lead a more normal life, working and exercising without the regular long visits to the hemodialysis centers.

### **Cooperation countries**

Greece, Netherlands, Germany, France, Austria, Switzerland

### **FP7 Evaluation Achievements**

3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.





Starry night bicycle path. Daan Roosegaarde  
Source: *Hollandse Hoogte / Maikel Samuels*

# Norway

## Name

Eurostars (1)

## Year/duration

2008-2013 (Eurostars (1) – Eurostars 2 is running from 2014 to 2020)

## Website

[www.eurostars-eureka.eu](http://www.eurostars-eureka.eu)

## Results

The Final Evaluation of the Eurostars Joint Programme by the expert group led by Marja Makarow found that: “Eurostars is a unique programme to support bottom-up, near-market-research of SMEs in participating countries. Overall, the results of this evaluation provide evidence for the success of the programme and the worthwhile nature of the public money from the EU and the participating countries. The programme contributed to employment generation, improved the competitive position of participants in the market place and contributed to the development and roll-out of new and improved products and services. There is room for improvement in the implementation of the programme so that the positive overall impacts of the programme will become even larger in the future.” Eurostars has been a great success for Norwegian R&D performing SMEs. It is the first international program that has given them the possibility to work with the partners that they need to fulfil their own R&D strategies and goals, and given them new market contacts. The international

expert assessment and independent evaluation panel contributes to strong competition and high quality.



## Expected socio-economic impact

“The employment growth rate of R&D-performing SMEs funded by Eurostars was nearly twice as high as that of applicant SMEs which were not funded. This can be causally attributed to Eurostars funding.” ... “The programme has accelerated the development and roll-out of new and improved products, processes and services. The econometric evaluation established a positive and significant impact on the patent portfolio of funded firms relative to unfunded applicants. The programme has stimulated new cross-border collaborations that the members of the funded consortia intend to continue beyond the Eurostars funding period.” (Final Evaluation of the Eurostars)

## Description

Eurostars (1) was a joint programme (article 185) between EUREKA and the European Commission, and was co-funded from the national budgets of 33 Eurostars Participating States and by the European Union through FP7. Total public spending on projects in the programme was 465 M€, of this 95 M€ from FP7. The programme is dedicated to R&D-performing SMEs, with an aim to develop new products, processes or services. Eurostars is continued under Horizon 2020 as Eurostars 2

### **Cooperation countries**

33 EUREKA member countries and the European Commission

### **FP7 Evaluation Achievements**

3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
7. Encouraged harmonisation of national research and innovation systems and policies.
10. Reached a critical mass of research across the European landscape

# Poland

## Name

EPISTOP

Long-term, prospective study evaluating clinical and molecular biomarkers of epileptogenesis in a genetic model of epilepsy – tuberous sclerosis complex

## Year/duration

01/11/2013 – 31/10/2018 (five years)

## Website

[www.epistop.eu](http://www.epistop.eu)

## Results

We expect that the EPISTOP project will generate significant and valuable new knowledge of potential use in clinical practice in the care of epilepsy patients:

- insight into the development of EEG changes before the onset of clinical seizures
- insight into epileptogenesis and molecular biomarkers of epilepsy
- possible new targets for novel antiepileptic and antiepileptogenic drugs
- potential prevention of epilepsy by introducing antiepileptic drugs in patients at risk
- molecular mechanisms of epileptogenesis that might be modified by epilepsy prevention
- clinical risk factors for epilepsy and its neuropsychiatric consequences
- mechanisms of drug-resistant epilepsy, to identify new therapeutic strategies

## Expected socio-economic impact

Despite a great progress in the management of epilepsy, still one third of patients is refractory to available medications. The incidence of epilepsy is highest in infancy and 50% of children experience epilepsy-related comorbidities, such as developmental delay and autism. The development of epilepsy (epileptogenesis), extensively studied in animals, is barely studied in humans, as patients usually present AFTER the seizure onset.

EPISTOP is the first prospective study of epileptogenesis in humans, beginning BEFORE seizures and continuing through age 2+ years, permitting detailed analysis of the onset, drug-resistance, and comorbidities of epilepsy. To maximize information derived from the study we have chosen homogenous group of patients with prenatal or early infantile diagnosis of Tuberous Sclerosis Complex (TSC). A clinical randomized study of pre-seizure treatment in TSC infants is a part of the project. Altogether, EPISTOP should contribute to reduction of the costs of epilepsy treatment and the social burden related to this disease. EPISTOP aims to lower the incidence of drug-resistant epilepsy, and epilepsy comorbidities. The explicit conclusion about the clinical improvement in neurodevelopmental outcome and the decrease of epilepsy incidence and severity in patients treated before the onset of clinical seizures will reduce the costs of epilepsy treatment and the long-term social costs in this group of patients. It will also give rationale for



introduction of similar interventions in other groups of patients at risk of epilepsy.

### **Description**

The aim of EPISTOP is to better understand the pathophysiology of epilepsy and its consequences, to develop a preventative strategy for epilepsy, to identify new biomarkers of epilepsy, and to develop new therapeutic targets to block or otherwise modify epileptogenesis in humans.

To achieve this aim, the risk factors and biomarkers of epilepsy will be identified by a multidisciplinary, systematic approach in three settings:

- a prospective study of epilepsy development in infants with TSC, using a wide range of clinical, neuroimaging, and genetic analyses, including a diverse set of cutting edge analyses of blood samples, that will be obtained at study entry, at the onset of epileptiform discharges on EEG, at seizure onset and at the age of 24 months.
- prospective clinical study of TSC infants treated with antiepileptic drugs at the onset of subclinical seizures in comparison to children treated AFTER clinical seizures appear, evaluating the benefit of preventative antiepileptic treatment and the possible mechanisms of epilepsy prevention
- analysis of biomarkers of epileptogenesis and drug-resistant epilepsy in epileptogenic brain specimens obtained from patients with TSC who underwent epilepsy surgery and TSC autopsy cases collected in the past.

### **Cooperation countries**

Italy, France, Belgium, Czech Republic, Germany, Netherlands, Austria, Poland, United States, Australia

### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
2. Addressed certain societal challenges through research, technology and innovation.

# Portugal

## Name

DEMOWFLOAT – Demonstration of the WindFloat Technology

## Year/duration

Start 2011 (3 years)

## Website

[www.demowfloat.eu](http://www.demowfloat.eu)

## Results

Demowfloat aimed at leveraging the Windfloat Pilot project, a floating structure with a 2 MW wind turbine currently being tested in an offshore test site in northern Portugal.

The objective of Demowfloat was to make extensive testing, monitoring and data gathering from the existing pilot project and to gather the needed evidence for scrutiny of the financial sector.

It is a case-study of combination of private and public funds (FP7, national and EU Structural Funds). It became, in its own merit, a real research infrastructure.

At the end of this project, the promoters were able to secure significant funding from the EIB for a large-scale deployment, in a scheme that is similar to EFSI but concluded before its implementation.

Expected socio-economic impact

This system fits perfectly within the EU Energy Policies (increased share of Renewable Energy in electricity network) and the SET-Plan, thus contributing to the EU Sustainability and Climate Change policies.

## Description



This project is fully aligned with the Portuguese priority for green energy and sustainability and it illustrates an excellent collaboration between the public and private sectors.

## Cooperation countries

Portugal, Denmark, The Netherlands, UK and USA

## FP7 Evaluation Achievements

10 Reached a critical mass of research across the European landscape and worldwide. Human and financial resources were made available to attract many organizations and individuals to collaborate with or work at European research institutions. Furthermore, it showed that research is an essential instrument for economic and social development.

It also showed the importance of involving Third Countries in the EU FP projects. The present tendency for



reduced opportunities for third countries, namely the less-developed countries in Africa and South America (e.g., small CICA-type projects), should be reversed.

---

---

### Name

UAN – Underwater Acoustic Network

### Year/duration

Start 2008 – 3 years

### Website

[www.siplab.fct.ualg.pt](http://www.siplab.fct.ualg.pt)

### Results

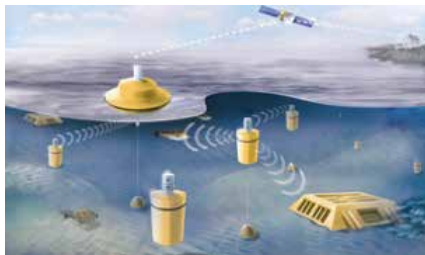
This project allowed, for the first time, that an acoustic network with fixed and mobile nodes was seamlessly integrated in a land communication network and demonstrated to be fully operational at sea. This represented a landmark in underwater communication functionality in general and for security applications in particular. This breakthrough opens up the possibility for easy deployment of a surveillance network around any coastal facility, either permanent or temporary, with a potential impact in any exploratory deployment for search and rescue, for detection, mapping or protection of sensitive sites and environmental observatories.

### Expected socio-economic impact

The ability to communicate between various submerged Platforms in a network fashion is a must have requirement not only for security or surveillance purposes but also for any exploratory mission involving various fixed and/or moving

platforms operating in cooperation. Potential beneficiaries include any entity involved with ocean exploration, e.g., the scientific community, oil and gas exploration, port authorities, civilian search and rescue operation bodies and the military. Industrial/commercial applications are in the pipeline, with creation of new jobs. Further scientific developments will surely follow too.

### Description



This project is fully aligned with the Portuguese priority of exploitation and development of Sea and Deep Sea resources.

### Cooperation countries

Portugal, Italy, Norway and Sweden

### FP7 Evaluation Achievements

5 Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges through cross border and cross sector cooperation. This is the true essence of the various European Framework Programmes, a key feature that must be preserved and strengthened.

# Romania

## Name

Strengthening the Romanian research capacity in Multifunctional Polymeric Materials (FP7-REGPOT-2010-1)

## Year/duration

2011 (42 months)

## Website

[www.regpot-stream.ro](http://www.regpot-stream.ro)

## Results

- Reorganisation of the “Petru Poni” Institute of Macromolecular Chemistry (PPIMC) to focus research efforts into four interdisciplinary streams: supramolecular/ interface chemistry and physical chemistry; bio-based polymeric materials, environmental protection and energy conservation; bio-oriented polymeric materials; and polymers for high-tech applications;
- Improvement of the research infrastructure of PPIMC, including a high-resolution electron transmission microscope and a small angle X-ray scattering spectrometer. and provided the training for use the machines;
- 13 experienced researchers hired, out of which 8 integrated into the institute staff and training programmes organised and monitored;
- Researcher exchanges between the PPIMC and its European partner institutes which led to 18 new interdisciplinary research collaborations;
- Increased visibility of PPIMC through participation in various workshops and symposia;

- Research excellence at the PPIMC strengthen and connect the Romanian chemical research network to the ERA;
- A Polymer Sciences and Technology Platform gathering STREAM associated partners and Romanian companies.



## Expected socio-economic impact

On PPIMC development:

- Research strategy of PPIMC in accordance with ERA priorities;
- Improved human resources capacity;
- Modernized research infrastructure;
- Optimized response to wider societal and economic needs;
- Higher visibility at both national and international levels;
- Increased participation in multi-partner national and international projects.

Since the development of the project was accompanied by other synergistic projects funded through H2020, Structural Funds (OP for competitiveness and for human resources) and national funds, the following can be mentioned for the regional/national/European levels:

- Strengthened and enlarged regional/ national cooperation networks with entities of complementary expertise and interest (universities, other research centres, SMEs or other companies);
- Diversification of the partners;
- Consolidated and increased scientific reputation at regional and national level;
- Improved research and innovation capacities of the region and of the country;



- Increased participation of R&D national partners in international projects;
- Increased interest of young generation for a research carrier;
- Job creation/new job opportunities;
- Training of young people;
- Increased awareness of general public towards science and especially towards chemistry;
- Lasting scientific/technological, societal and integrating effects European dimension.

### Description

Within the STREAM project, PPIMC aimed at further strengthening its research capacity in the targeted scientific sectors by means of mobility and knowledge exchanges with excellent research EU institutions, participation and organization of scientific events, hiring of experienced researchers, up-grading of its laboratories and networking with both industry and other research organizations, but most of all through a complete reshaping of its internal organization. PPIMC ambitions are to adopt a totally integrated interdisciplinary approach.

The project has strengthened the research excellence of the institute and therefore increased the attractiveness of the scientific career for young researchers in Romania. The project also reinforced the capacity of business and governmental exploitation of research results and cooperation with industry and set up a bridge between the Romanian chemical network and the ERA.

In order to meet the main goal to improve the research potential at PPIMC, STREAM planned to reinforce and strengthen the established collaborative links with leading

European institutions undertaking research and practice in Polymer Science. A complex schedule of exchange visits at different scientific level allowed the transfer of knowledge in the area of planning according to the social needs, management and supervision of strategic research activities in the concerned field. Within the STREAM proposal PPIMC collaborated actively with 13 research centres from Europe.

The implementation of the project is strongly connected, within PPIMC, with other synergistic projects (referred above):

- The creation of the Centre of Advanced Research in Bionanoconjugates and Biopolymers (IntelCentre) started in 2009 with financial support from the ESF through the Sectoral Operational Programme (SOP) "Increasing of Economic Competitiveness". The project aimed at building a new centre integrated in PPIMC with R&D facilities at a level comparable to that of top research centres in Europe. The STREAM project allowed IntelCentre to hire young researchers/postdoctoral researchers and also finance PhD positions. Also, specialists in applied life sciences and biotechnology or bio-related areas were invited for lectures and short courses during the project.
- The C.I.Simionescu Postdoctoral Fellowships Programme, financed by the ESF through SOP "Human Resources Development" ensured the training of postdoctoral researchers in the main research areas of the IntelCentre.
- The project Biologically Inspired Systems for Engineered Structural and Functional Entities is just an example of the excellence research project of IntelCentre financed by

the National RDI Plan2 for 2007-2013.

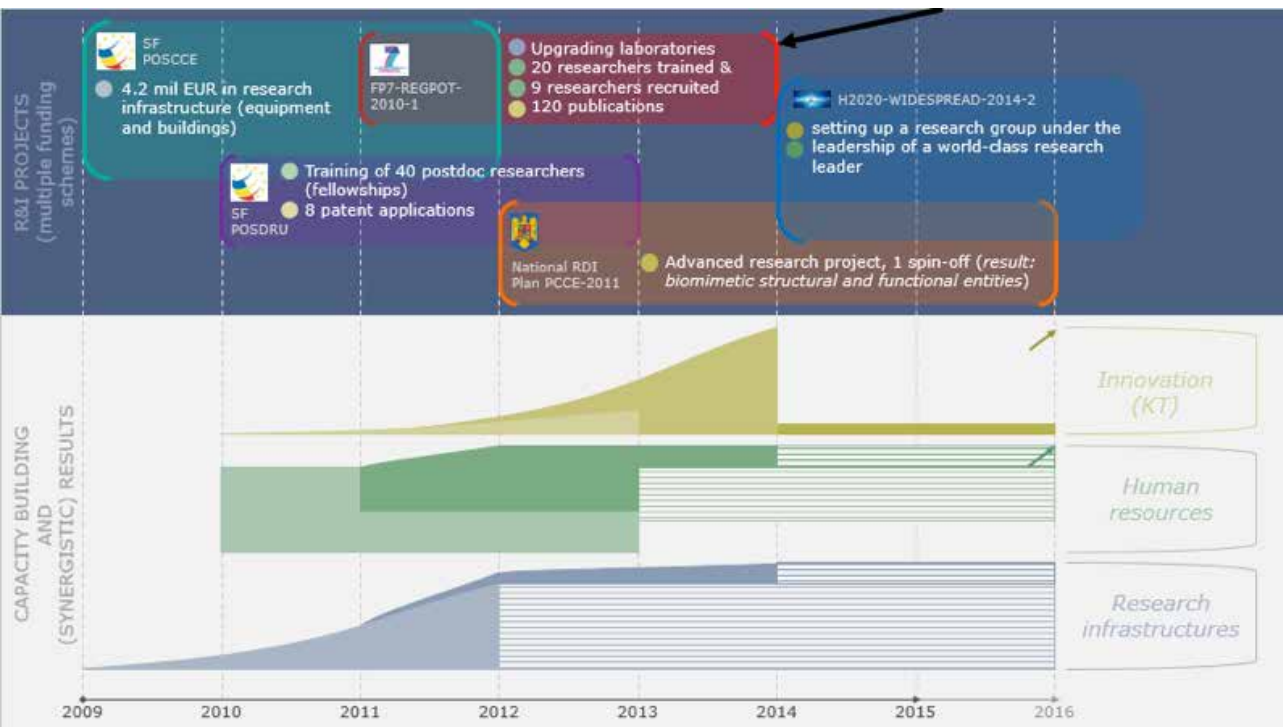
- The H2020-ERACHair project “Laboratory of Supramolecular Chemistry for Adaptive Delivery Systems”- SupraChemLab will support the on-going research developed at IntelCentre.
- For a better understanding of the institutional/ developmental framework of the project, a scheme of the synergies between the various initiatives is presented in the figure bellow.

### Cooperation countries

Austria, France, Germany, Poland, Slovenia, Spain and Switzerland

### FP7 Evaluation achievements

1. Encouraged scientific excellence on individual and institutional level;
4. Reinforced a new mode of collaboration and an open innovation framework;
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges;
8. Stimulated mobility of researchers across Europe;
9. Promoted investment in European research infrastructures.





# Slovakia

## Name

EBBITS Enabling business-based Internet of Things and Services - An Interoperability platform for a real-world populated Internet of Things domain

## Year/duration

2010-2015

## Website

[www.ebbits-project.eu](http://www.ebbits-project.eu)

## Results

EBBITS project aims at enabling business-based Internet of Things and Services. Potential impact of EBBITS platform will be demonstrated in two areas:

- (1) manufacturing, where platform should help to manage production optimization with special focus on energy consumption in the optimization process, and
- (2) food producing industry, supporting the service and resource traceability at the consumption stage.

## Expected socio-economic impact

New business and manufacturing models

## Description

The EBBITS project aims to develop architecture, technologies and processes, which allow businesses to semantically integrate the Internet of Things into mainstream enterprise systems and support interoperable real-world, on-line end-to-end business applications. It will provide semantic resolution to the IoT and

hence present a bridge between enterprise applications, people, services and the physical world, using information generated by tags, sensors, and other devices and performing actions on the real-world. The ebbits platform will support interoperable business applications with context-aware processing of data separated in time and space, information and real-world events (addressing tags, sensor and actuators as services), people and workflows (operator and maintenance crews), optimization using business rules (energy and cost performance criteria), end-to-end business processes (traceability, life-cycle management), or comprehensive consumer demands (product authentication, trustworthy information, and knowledge sharing). The Intrepid platform will feature a Service oriented Architecture based on open protocols and middleware, transforming every subsystem or device into a web service with semantic resolution. The ebbits platform thus enables the convergence of the Future Internet into the "Internet of People, Things and Services (IoPTS)" for business purposes. The ebbits platform will be demonstrated in end-to-end business applications that feature on-line monitoring of a product in its entire lifecycle. The project will develop and demonstrate two ebbits IoPTS applications. The first application demonstrates real-time optimization metrics and energy savings in manufacturing processes. The other demonstrates on-line traceability with enhanced information on food. The ebbits partners have made substantial



contributions to the work of the CERP-IoT. The ebbits project will provide the solutions to a large part of the Strategic Research Roadmap.

Cooperation countries Germany, Sweden, Slovak Republic, Denmark.  
FP7 Evaluation achievements 4.  
Engaged industry and SMEs strategically 10.  
Encouraged scientific excellence on individual and institutional level

---

---

### Name

SECRICOM

### Year/duration

2008 - 2012

### Website

[www.secricom.eu](http://www.secricom.eu)

### Results

The SECRICOM will develop and demonstrate a secure communications infrastructure for public safety organisations and their users. Achievements will include:

- The exploitation of existing publicly available communication network infrastructure with interface towards emerging SDR systems
- Interoperability between heterogeneous secure communication systems
- A parallel distributed mobile agent-based transaction system for effective procurement
- Infrastructure based on custom chip-level security

Applications of SECRICOM results are envisaged in these areas:

- Emergency responders – paramedics,

police, fire brigades

- Public bodies – crisis management headquarters
- eHealth systems – structures of the future with interaction on various levels
- eCommerce – heterogenous logistics systems

### Expected socio-economic impact

Support the security of European citizen in times of crisis.

### Description

SECRICOM is proposed as a collaborative research project aiming at development of a reference security platform for EU crisis management operations with two essential ambitions:

- (A) Solve or mitigate problems of contemporary crisis communication infrastructures (Tetra, GSM, Citizen Band, IP) such as poor interoperability of specialized communication means, vulnerability against tapping and misuse, lack of possibilities to recover from failures, inability to use alternative data carrier and high deployment and operational costs.
- (B) Add new smart functions to existing services which will make the communication more effective and helpful for users. Smart functions will be provided by distributed IT systems based on an agents' infrastructure. Achieving these two project ambitions will allow creating a pervasive and trusted communication infrastructure fulfilling requirements of crisis management users and ready for immediate application.

The SECRICOM solutions are based on four technological pillars: (1) Secure encrypted mobile communication on existing infrastructures (GSM, UMTS networks) –

secure push to talk systems. (2) Improved interoperability among various existing communicating systems, creating recoverable networks and seamless connectivity. (3) Introduction of distributed systems and the agent paradigm forming a smart negotiating system for parameterization and independent handling of requests suitable for rapid reaction use. (4) Security based on trusted hardware enhancing the confidentiality of data and the privacy of users. The SECRIKOM will assure interface from systems currently deployed for crisis management to systems of new generation which will be defined in next decade such as SDR. Important impact is to enable seamless and secure interoperability of existing hundreds thousands radios already deployed to ensure the protection of invested resources and adaptivity to future development and emerging technologies.

#### **Cooperation countries**

Germany, Slovak Republic, Luxemburg, Poland, UK, France, Austria and Greece.

#### **FP7 Evaluation achievements**

1. Encouraged scientific excellence on individual and institutional level.
4. Engaged industry and SMEs strategically.
6. Addressed certain societal challenges through research, technology and innovation.

# Slovenia

## Name

XLike

## Year/duration

1/1/2012-21/12/2014 (36 months)

## Website

[www.xlike.org](http://www.xlike.org)

## Results

The most visible is the system “Event Registry” ([eventregistry.org](http://eventregistry.org)) collecting information from global news sources in 100 languages, organizing news stories into events and storylines, allowing deep insights into global social dynamics. The results of the project triggered several new H2020 EU projects (XLime and RENOIR). There is a startup (on predicting future events) in preparation and several commercial services for dealing with cross-linguality.

## Expected socio-economic impact

We could say, the results of the project are a game changer in the area of cross-linguality. As a consequence, several major news agencies and publishers (like Bloomberg and NY Times) have interest to include our technology in their existing systems. To summarize – the results of the projects are “technological enablers” opening new market opportunities by extending more traditional monolingual services into cross-lingual services.

## Description

XLike (Cross-Lingual Knowledge Extraction) project’s main goal was developing technologies to extract knowledge from documents written in many languages and to track information-flow across languages. Some of the project’s results are unique, not available elsewhere. (Project reference: 288342\_)

## Cooperation countries

Slovenia (coordinator), Germany, Spain, Croatia, China, USA, India

## FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
2. Promoted ground breaking research through a novel programme FP7 IDEAS (ERC).
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national research and innovation systems and policies.
8. Stimulated mobility of researchers across Europe.



---

---

### Name

EUROLIS

### Year/duration

1/10/2012-30/09/2016 (48 months)

### Website

[www.eurolis.eu](http://www.eurolis.eu)

### Results

The EUROLIS project aims to develop sustainable and advanced lithium sulfur (Li-S) battery for automotive use. The progress in the project relies on deep analytical work supported by theoretical calculations and unified characterization tools which results in the innovative approaches supported by full understanding of Li-S battery electrochemical behavior within different configurations. The optimal configuration of the electrolyte, separator and cathode composite is scaled up and used in the prototype cells applicable to electric vehicles (EV). The work within the project has a large scientific and technological impact on the potential Li-S battery production in the future.

### Scientific impact:

- development of new materials with properties required for Li-S batteries;
- use of a modelling approach with the aim to understand interactions between different components and polysulfides;
- application of different analytical tools which are described in published scientific papers;

### Technological impact:

- developed know-how about cylindrical Li-S batteries production;
- implementation of laboratory results into prototype cells;
- protection of knowledge.

### Expected socio-economic impact

Consortium effectively enables the project to fully cover whole range of R&D including manufacturing, battery tests and it demonstrates the interest of European automotive industry and European battery makers in the proposed technology. The proposed technology is foreseen as a battery configuration close to the market that will be able to fulfil expectations of end users to have EVs with a driving range of at least 500 km, and it gives Europe an exceptional opportunity to ensure EU market share on beyond Li-ion technologies. Battery producer (SAFT) within the consortium is helping us to turn innovative ideas into marketable products which can create new jobs. OEM's partners (Volvo, Renault) are in the position to be in touch with new battery technology to be ready for its exploitation in future EVs. All partners together through the dissemination and clustering activities are sharing awareness about new battery concept bringing electromobility closer to users.

### Description

EUROLIS started in October 2012. The project is divided into three parts corresponding to three generations of Li-S battery prototypes. At the beginning we started with R&D from selected state-of-the-art materials focusing on the improvements of the cathode and electrolyte including development and standardization of in situ analytical methods for the



project. Six new analytical tools have been developed within the project, giving us a unique opportunity to understand the electrochemical behavior of different components within the battery. The compatibility and the synergy of the cell components were implemented in the 1st generation prototype (battery type 18650). The achievement during the 1st reporting period is a formation of Li-S battery production chain, where each partner in the consortium has defined role in preparation of the components, their testing, manufacturing the prototype cell or in the electrochemical tests.

In the 2nd reporting period consortium has successfully continued research and development of different parts of Li-S battery (LSB), leading to improved components. A completely new type of carbon host matrix was developed scaled up and implemented into the prototype cells. A similar approach was used in the development and selection of new electrolyte. The cells for both generations have been tested in different climate environments using different cycling regimes. We have demonstrated that the cells can be cycled under realistic EV profile (Dynamic Stress Cycling). Prototype cells from the 2nd generation showed improved properties in terms of energy density, cycling stability and power density. That proves correct direction of the research activities and Li-S battery cell development.

Additional activities related to the preparation of materials for the 3rd generation of prototypes were successfully accomplished. We improved materials and procedures with a focus to achieve properties of LSB cells written in the project objectives. Batteries will be tested

in the last 6 months of the project.

Additional activities within the EUROLIS project are devoted to the benchmarking of other possible configurations of Li-S batteries. Here we are mainly focusing on the use of all solid state or polymer batteries, since both of them can efficiently prevent polysulfide migration/diffusion. In addition, the use of silicon anodes and of a redox flow battery configuration is tested and compared with other LSB configurations.

Ten scientific articles have been accepted and are available in different peer-reviewed scientific journals of high repute. The project has been presented at several conferences, including several invited presentations at leading international meetings on the field of batteries and materials.

#### **Cooperation countries**

SI (coordinator), FR, DE, SE, IT

#### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
7. Encouraged harmonisation of national research and innovation systems and policies.
8. Stimulated mobility of researchers across Europe.
10. Reached a critical mass of research across the European landscape and worldwide.

# Spain

## Name

INCLUD-ED

## Year/duration

Start 1/9/2004 (42 months, FP6)

## Website

[creaub.info/included](http://creaub.info/included)

## Results

The INCLUD-ED project achieved an increase from 15% to 85% in the number of children achieving basic reading levels. The key to this success was the involvement of families –especially female relatives- and local communities, using a new approach linking education to family circumstances.

Other results already achieved by 2014:

1. Reducing absenteeism and early school leaving: Overcoming of the absenteeism (from 30% to occasional) in 3 academic years. La Paz Primary School (highly deprived area, Albacete).
2. Increase in school performance (performance rates): Case studies performed at La Paz Primary School (highly deprived area); Alberich i Cases Primary School (middle-class schools); in Castoverde Pre-school and Primary School (rural area) with outstanding results. Among them:
  - Increase of the scores in a school with high rates of migrant students: Increase in the percentage of students who pass the official exam on reading skills from 17% to 85% in 5 years (2001-2006).

- High increase of the scores in a school with high rates in Roma student population (Catalonia): Increase of a 58,95% in the percentage of students who achieve read and write skills in pre-primary education (5 years old) in 2012-2013.

3. Expansion in number of schools implementing SEAs: In 2014, there are more than 200 Learning Communities, schools that are implementing SEAs, after the Includ-ed Project. Approximately 70 schools in Brazil and 23 schools in Peru, Mexico and Colombia are implementing SEAs. More than 50 parent's associations in Catalonia are implementing SEAs.
4. Creation of employment in locations of extreme poverty: 586 jobs in one of the poorest neighbourhoods in southern Europe. Miguel Fenollera cooperative: 10 permanent positions in the cooperative, 570 contracts in the agricultural sector and 6 in the educational sector.

## Expected socio-economic impact

Tangible short-term impacts already described as results. Impact to be extended in the medium/long term. Contribution to the following objectives:

- Increasing employment of the population aged 20-64 (EU target = 75% employed)
- Reducing the rate of early school leavers (EU target = being below 10%)
- Increasing the rate of 30-34-year-olds completing third level education (EU target = 40% at least)



- Reducing the number of people in or at risk of poverty and social exclusion (EU target = 20 million less).

### Description

INCLUD-ED main objective was to analyse educational strategies that contribute to social cohesion and educational strategies that lead to social exclusion, providing key elements and lines of action to improve educational and social policy.

INCLUD-ED analysed educational strategies that contribute to overcome inequalities and promote social cohesion, and educational strategies that generate social exclusion, particularly focusing on vulnerable and marginalised groups. The project identified Successful Educational Actions transferable to different social contexts that improved learning in European schools.

### Cooperation countries

Spain, Austria, Belgium, Ireland, Cyprus, Finland, Hungary, Italy, Lithuania, Malta, Latvia, Romania, Slovenia and United Kingdom.

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
5. Strengthened the ERA by catalysing a culture of cooperation.
6. Addressed certain societal challenges through research, technology and innovation.

---



---

### Name

ORCHESTRA. Open Architecture and Spatial Data Infrastructure for Risk Management

### Year/duration

FP6. 1 September 2004. 42 months.

### Website

[www.eu-orchestra.org](http://www.eu-orchestra.org)

### Results

Following three years of intensive collaboration with Member States experts and stakeholder consultation, the European Commission adopted on the July 2004 a proposal for a Directive establishing an infrastructure for spatial information in the Community (INSPIRE) (COM(2004) 516 final). The adoption of the proposal marked an important step on the way forward to a European-wide legislative framework that helps in achieving a European Data Spatial Infrastructure (ESDI). The ORCHESTRA project contributed to the implementation of the INSPIRE Directive, with several pilots that led to the definition of common technical models and standards.

Orchestra can be used, for example, for risk management at coastal zones. The study of the environmental risks which may be generated from maritime transport activity in coastal European waters requires the establishment of advanced modelling techniques and evaluation benchmarks.

Orchestra can help assess the environmental risks induced by ship traffic activity. This can be efficiently achieved through a generic sharing of common toxicity, traffic net-

works, coastal zone environmental databases and numerical modelling kernels. The tangible results of the project can be found in its website:

- ORCHESTRA Architecture Reference Model
- ORCHESTRA Service Specifications
- ORCHESTRA book:  
[www.eu-orchestra.org/docs/ORCHESTRA-Book.pdf](http://www.eu-orchestra.org/docs/ORCHESTRA-Book.pdf)

### Expected socioeconomic impact

With ORCHESTRA an institution working in environmental risk & disaster management can decide which of their services or applications they want to make accessible (with or without restrictions), and achieve this with minimum technical and economic efforts following the architecture directives.

Aligned with worldwide initiatives.

ORCHESTRA architecture was the first that has reached *Best Practice status within the world-wide standards organisation OGC*.

ORCHESTRA provided considerable material for the European chapter and participated at the Ministerial Summit held in Cape Town in November 2007.

Linked to EU initiatives like *INSPIRE* and *GMES*. Linked with other projects that are based on ORCHESTRA results, such as *SANY*, *DEWS* or *EO<sub>2</sub>HEAVEN*.

ORCHESTRA has been deployed in *4 pilots* (2007-2008) and *applied to the tsunami early warning system of the German government in the Indian Ocean* (2007-2010).

### Description

The main goal of Orchestra is to design and implement an open service oriented software architecture that will improve the interoperability among actors involved in multi-risk management.

### Cooperating countries

Spain, Austria, Belgium, European Commission (JRC), France, Germany, Italy, Switzerland and United Kingdom.

### FP7 Evaluation Achievements

4. Reinforced a new mode of collaboration and an open innovation framework.
6. Addressed certain societal challenges through research, technology and innovation.
9. Promoted investment in European research infrastructures.



Above: nl\_548. Source Netherlands Enterprise Agency  
Below: LED bulbs. © PHILIPS



# Sweden

## Name

Integrated Mobile Security Kit

## Year/duration

2009-2012 (4 years)

## Website

[www.imsk.eu/imskintro/imskintro.html](http://www.imsk.eu/imskintro/imskintro.html)

## Results

The Integrated Mobile Security Kit (IMSK) project combined existing and new technologies into a mobile system for rapid deployment at venues and sites (hotels, sport/festival arenas, etc) which temporarily need enhanced security.

IMSK illustrates well a pan-European project formed to address a pressing need of the society. The project involves industry, small and medium-sized companies as well as end-users such as the Swedish National Police Board and Deutscher Fussball Verbund and aimed to develop innovative solutions to strengthen citizens' security at large events. The project has employed legacy and novel sensor technologies, designed an IMSK-system that has integrated sensor information to provide a common operational picture where information is fused into intelligence. The project has performed a field demonstration to validate the concept and finally disseminated the results after accreditation by end-users. Additional to this there are several sensors that have been developed within IMSK like detection of CBRNE, 3DFace Recognition, Passive THz camera

for detection of hidden weapons etc, detection of objects through walls, etc. allowing for future development.



## Expected socio-economic impact

The goal of the project was to increase the security of the citizens at the scope of events gathering a large number of people. The continuously evolving threat of unpredictable terrorist activity demands the innovative application of existing and developing technology for the protection of the EU's citizens. Citizens' safety is improved at event due to real time detection of substances and the effective use of new sensor technologies. The use of technology also improves working conditions for security personnel due to possibilities for stand-off detection. Added value for society is evident when future investments for blue light organisations are reduced as industry group development of new common message protocols allow for new technology to be more easily integrated. Costs would also be reduced as the system will use less operators than usual. Further, the integrity is ensured as the system is tracking behavior rather than individuals.

## Description

The IMSK-project aimed at enhancing the security of the citizens in the scope of large events such as sport events, concerts, demonstrations, etc. Such events pose major security challenges since one has to be able to scale up security measures during the event as well as being able to

rapidly remove any technical installations after completion of the event. The project gathered industry, researchers and end-users from a large part of Europe in a successful collaboration to meet the societal challenge of keeping large scale public events secure.

The work performed during the IMSK-project has been divided into six main parts, 1) Operational analysis, 2) Technical analysis, 3) System design and development, 4) Field Trial Development, 5) Field Trial and 6) Dissemination. A field trial as well as a demonstration workshop was held within the project which allowed all stakeholders to review and discuss the trial, especially the performance evaluation and exploitation aspects. The system needed to be mobile and adaptable in order to address situations of different kinds and different locations. The main objective of the IMSK-project was the study, development, assessment and promotion of such a system, the IMSK, providing emerging solutions for increased probability of rapid detection and response to threats.

#### **Cooperation countries**

Sweden (coordinator, SAAB), Italy, United Kingdom, France, Germany, Finland, Slovenia, Estonia, Denmark, Belgium,

#### **FP7 Evaluation achievements**

3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
6. Addressed certain societal challenges through research, technology and innovation.
10. Reached a critical mass of research

across the European landscape and worldwide.

---

---

#### **Name**

TREATPD: Cell and gene therapy based approaches for treatment of Parkinson's disease: from models to clinics .

#### **Year/duration**

2009-2014 (ERC Starting grant)  
2011 (ERC Proof of Concept)

#### **Website**

[erc.europa.eu/projects-and-results/erc-stories](http://erc.europa.eu/projects-and-results/erc-stories)  
[erc-grantee-and-regional-government-set-gene-therapy-centre](http://erc-grantee-and-regional-government-set-gene-therapy-centre)

#### **Results**

The research findings were promising both academically and commercially, but in this field the success is dependent on the ability to translate the frontier research into clinical trials. The hurdles are even bigger for non-traditional drug candidates, especially gene therapies that require tests in hospitals. Usually, hospitals are not designed to handle such specialised activities and have no trained personnel to do it. To be able to translate the research into clinical trials and thus commercial applications, Prof. Kirik needed partners who would be able to handle testing gene therapies. In October 2015 the Skåne Regional Council decided to form a jointly owned company with Braingene to build a specialised hospital dedicated to implementation of gene therapies. It's the first time in Nordic countries that the public sector engages in implementing a future

clinical treatment facility with a small spin-off company.

#### **Expected socio-economic impact**

The facility will focus on early and later-stage clinical trials leading to new drug approvals, and will ultimately make these future therapies available for clinical practice.

#### **Description**

Parkinson's disease is a neurodegenerative brain disorder affecting people's ability to regulate their movements, body and emotions. There is currently no definite cure for it. Deniz Kirik, professor of neuroscience at Lund University in Sweden, implemented what the industry calls a disruptive technology: introduce harmless viruses into brain cells to deliver therapeutic genes in a controllable and personalized manner. In 2009 he received an ERC Starting Grant to collect scientific evidence that such a treatment could reverse the disease's symptoms and replace the lost brain functions in animals. As his project was making progress, three years later he applied for an ERC Proof of Concept grant to test the market potential of his findings. The grant enabled him to get help from business experts to start a new company, Braingene. He contacted venture capital firms, industry leaders, and he applied for patents.

#### **Cooperation countries**

N/A

#### **FP7 Evaluation achievements**

N/A



# Switzerland

## Name

BOC (Body on a chip)

## Year/duration

01.06.2012 – 31.05.2015 (36 months)

## Website

[www.insphero.com/company/eu-project-the-body-on-a-chip](http://www.insphero.com/company/eu-project-the-body-on-a-chip)

## Results

The project:

- Brought together an SME, a major company and academic players
- Produced a robust prototype for a “body on a chip” that may reach the market within 2-3 years
- Produced excellent scientific output (example: a publication in Nature communications [www.nature.com/ncomms/2014/140630/ncomms5250/pdf/ncomms5250.pdf](http://www.nature.com/ncomms/2014/140630/ncomms5250/pdf/ncomms5250.pdf))
- Led to a very promising follow-up project that is funded in the framework of a FET Open high-tech SME project

## Expected socio-economic impact

When the expected product (a “body on a chip”) indeed reaches the commercialization stage, it should not only strongly impact on the company commercializing the product but it may also have a serious impact on:

- other companies that can integrate the product in the pre-clinical trial phase of pharmaceuticals they are developing (thereby saving time and money)

- patients that can benefit from newly developed pharmaceuticals that are on the market more rapidly, possibly cheaper and as safe as other pharmaceuticals developed in the “traditional pre-clinical framework”
- the health care system as a whole since patients might benefit at an earlier time point from potentially more affordable pharmaceuticals (“Health” was identified by the European Commission as one of the Grand Challenges)

## Description

The project aims at developing a “body on a chip” (in vitro 3D cell-based assay) that simulates several organs and the metabolic processes taking place in these organs. This chip can be used in the pre-clinical phase of the development of new pharmaceuticals in order to detect toxic effects. Today, pharmaceuticals are tested on 2D cell-cultures that give results with limited quality since the cells in these cultures have short lifespans and therefore only allow detection of acutely toxic substances. Cells in a “body on a chip” have longer lifespans and thanks to their 3D arrangement and to the interconnection between the pseudo-organs they are integrated in, they mimic the body in a more accurate way. Hence, the quality of predictions is enhanced and long term toxicity can also be detected. That allows the earlier elimination of unsuitable substances from expensive pharmaceuticals development programmes.



The metabolization of pharmaceuticals by a human body should be understood in a much better way with a “body on a chip” analysis than with the methods used today.

#### **Cooperation countries**

Germany, Belgium, United Kingdom and Switzerland

#### **FP7 Evaluation Achievements**

1. Encouraged scientific excellence on individual and institutional level
3. Engaged industry and SMEs strategically
6. Addressed certain societal challenges through research, technology and innovation

# Turkey

## Name

Research Potential (REGPOT)

## Year/duration

2007-2013

## Website

N/A

## Results

REGPOT Programme was directed towards enhancing the excellence potential of selected public/private research institutes, universities, R&D Centres etc. Indeed REGPOT Programme was unique in a sense that it fostered STI based economic and social improvement not only at regional but also national levels. Moreover, the Programme facilitated internationalization of the centers or universities upon their own strategies. The Programme invested in research and innovation capabilities in a tailor made perspective for the centers. They could receive investments to solve their declared weaknesses and received guidance from more developed partners located in Europe. Moreover, this Scheme helped to build a regional perspective in STI based social and economic development strategies. Research centers are somehow channeled to consider their potential to enhance regional and national innovation systems. Their activities gained a momentum towards completing innovation based economic and social development strategies and mechanisms. 12 Research Centers of Excellence were

supported by 11 million €, which was %5,5 of Turkey's overall return in 7th Framework Programme



## Expected socio-economic impact

Building innovation skills and capabilities within intersectoral linkages at regional and national bases is a critical matter for economic and social advancement. In Turkish STI Policy context and Turkish Research Area concept, economic development is described beyond mathematical models pointing out solely increased income. Economic development is growingly associated with increased welfare and human development. Building innovation capabilities is a sophisticated process in need of investment to learning linkages among different sectors and STI actors. International cooperation is an indispensable element of the mentioned capability building process. Beyond its added value towards creating innovation learning linkages, REGPOT scheme could be said to effectively complete the achievements of FP7 for Turkey. This scheme was also influential in building long term capabilities for participation to FP7 via mobilizing key STI actors for fully exploiting their internationalization potential.

## Description

REGPOT scheme was very unique in the sense that it could support all of the following activities which are impossible to get from any other national or international programme:

- Investment to research infrastructure; purchasing and upgrading equipment, improvement of laboratories, etc.
- Recruitment of leading researchers from abroad
- Staff exchange and exchange of knowhow via networking and study visit activities
- Internationalization via cooperation with European and third country counterparts via dedicated events.

REGPOT scheme is somehow continued via Teaming and Twinning Calls under WIDESPREAD Programme of Horizon 2020 aiming to boost research excellence throughout the Union. Diminishing innovation clashes between European nations end even within different regions of MSs and ACs is a critical issue which would help sustaining Europe's global competitive position and even enhancing it. Those two Programmes are also critical in a sense that they are highly compatible with Turkish STI credentials and objectives resting on strengthening Turkey's global position and aiming to contribute international production of knowledge. In general EU Framework Programmes (EU FPs) are highly influential in strengthening STI base in Turkey through providing access to engage in world class partnerships, build networking activities and innovation capabilities including soft skills. Logic of participation to EU FPs in general is guided by our national grand STI objectives to be a Country offering its potential to internationally produced scientific advancements and utilizing its potential to the fullest in this respect. The long term engagement is also guided by integration to European Research Area and further sophistication of Turkish Research and Innovation Area (Ecosystem). Our

main motives of participation is underpinned especially by REGPOT and WIDESPREAD Programmes aiming to strengthen scientific performance in the Union through tailor made approaches denying one size fits all strategies.

### Cooperation countries

Turkish Applicants under REGPOT Programme could build relations with the Netherlands, Germany, UK, France, Belgium Poland, Italy, Spain and many other European Countries. Moreover third countries were also engaged.

### FP7 Evaluation Achievements

1. Encouraged scientific excellence on individual and institutional level.
3. Engaged industry and SMEs strategically.
4. Reinforced a new mode of collaboration and an open innovation framework.
5. Strengthened the European Research Area by catalysing a culture of cooperation and constructing comprehensive networks fit to address thematic challenges.
6. Addressed certain societal challenges through research, technology and innovation.
7. Encouraged harmonisation of national research and innovation systems and policies.
9. Promoted investment in European research infrastructures.
10. Reached a critical mass of research across the European landscape and worldwide.

# United Kingdom

## Name

Eurostars

## Year/Duration

2007-2014 – 7 years (successor programme started 2015)

## Website

[www.eurostars-eureka.eu](http://www.eurostars-eureka.eu) and  
[www.mendeley.com](http://www.mendeley.com)

## Results

The programme:

- generated added value for society, the economy, human life;
- triggered private investment and fostered new knowledge;
- created synergies with regional funds;
- attracted young talent.

We also saw an increased engagement by UK SMEs in European projects and collaboration with partners from across Europe. SMEs are traditionally a difficult demographic to engage in international collaborative projects. A particular strength of Eurostars is that SMEs lead projects, even when universities or other research performing organisations are involved.

Example:

In 2009 UK company Mendeley led a Eurostars MAKIN'IT project, collaborating with programmers in Austria and Estonia. The objective was to develop a database of academic knowledge, driven by semantic algorithms that efficiently manage and

share academic content based on user profiles and preferences. This led to the development of 'scrobbling' technology: using an algorithm that allows users to see and engage with the community that builds up around a research paper. Similar technology is used with music website last.fm. Mendeley went on to build a large user base, and successfully diversified to cater for research institutions such as Stanford University. After growth through successful private sector funding rounds, Mendeley was bought by Dutch academic publisher Elsevier in 2013.



## Expected socio-economic impact

Key metrics for Eurostars include:

- Over €1bn of funding for proposals across the programme as a whole
- On average, projects saw €1m of public funds + €1.4m of private funds leading to around €9.6m of additional turnover

Impacts expected from Eurostars:

- 10,000 jobs created across Europe
- 2,000 products, processes or services released on to market
- 60% of participants increasing their number of employees

## Description

Eurostars is a joint programme between national funding bodies and the EU. Eurostars focuses on R&D-performing SMEs that wish to lead transnational collaborative research projects, with rapidly-commercialisable results focused on innovative products processes and

services. Their involvement enables participants to combine and share creativity and expertise, and eases access to new markets for the resulting innovation.

There are more than 20 million SMEs in the EU. They represent the bulk of economic actors and are a critical driver of innovation and technological development. It is therefore crucial to unlock their potential.

The programme is managed by the EUREKA Secretariat on behalf of Member States and the European Commission.

### **Cooperation countries**

34 participating countries.

### **FP7 Evaluation Achievements**

The three FP7 evaluation achievements that are best covered by the Eurostars programme are:

1. Engaged industry and SMEs strategically
2. Reinforced a new mode of collaboration and an open innovation framework.
3. Encouraged harmonisation of national research and innovation systems and policies.

## **Colofon**

This is a publication of the Ministry of Economic Affairs and the Ministry of Education, Culture and Science of the Government of the Netherlands.

This document has been produced with the assistance of many country delegations. Their contribution has been extremely valuable and confirms how dedicated Europe is to research and innovation.

