2009/2011

ERA-NET EuroNanoMed

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Foreword

Virginie Sivan, EuroNanoMed Coordinator, CEA, France

EuroNanoMed ERA-NET initiative was created as a result of the commitment of funding organizations from 18 European member/associated states and regions sharing a common goal: to support together transnational RTD projects in nanomedicine.

Through 3 joint calls (JTC) for proposals launched from 2009 to 2011, EuroNanoMed served as an umbrella to fund 24 transnational research projects in which stakeholders from academia, industry, and hospitals collaborated to translate their knowledge in nanomedicine to clinical practice and medical products.

Improved treatment of cancer, hepatitis C, HIV with minimal side effects, early diagnosis of cancer, development of novel biomaterials to increase regeneration of ear, eye or bone: These are some examples of the significant medical needs addressed by the funded projects that open promising clinical applications for the patients and commercial development.

This booklet summarizes all the joint activities performed by the consortium from 2009 to 2011 and the results achieved so far, including the funded transnational research projects, the workshops organized on regulatory aspects, the publications, the reports, the collaborations and all the dissemination activities.

In order to attain a significant impact on the clinical outcome and economic development of nanomedicine in Europe and to guarantee long term and sustainable results, it is very important to continue this very successful cooperation between European and associated states funding agencies. To achieve this, most of the countries and regions involved in EuroNanoMed, as well as new partners, committed to a continuing project in order to lever the initial achievement to a higher level. We are looking forward to the support of the EC to implement all these in EuroNanoMed II.

Executive Summary

There is a global unmet need to cure and prevent diseases for which we currently lack efficient treatments, and which cause suffering and death. The prolonged life expectancy, the higher expectations for improved quality of life and changes in life-style of European citizens, all call for improved, more efficient and affordable health care.

Nanomedicine, the application of nanotechnology to health care, offers numerous promising possibilities to significantly enhance medical diagnosis and therapy. Furthermore, nanomedicine is an important strategic issue for the sustainable competitiveness of Europe. The strategic importance of nanomedicine is being increasingly recognised by governments and industry around the world. Coordinated efforts at the European level are therefore crucial in order to maintain its competitiveness.

The ERA-NET EuroNanoMed (ENM) initiative comprises of 24 partners from 18 countries or regions. EuroNanoMed aims at fostering the competitiveness of European nanomedicine players through the support of transnational collaboration, translational research and technological development projects with participants from academia, industry and clinical/public health communities.

The EU funds the extra costs incurred for the coordination of the joint activities of the national and regional funding organisations. ERA-NET EuroNanoMed, launched in January 2009, published a Strategic Agenda for EuroNanoMed activities, stating the EuroNanoMed initiative, strategy, organization and foreseen joint activities.

Originally the project aimed to publish and handle two Joint Calls for Proposals which were launched in May 2009 and March 2010 respectively, each resulting in eight funded projects. The overall funding of the first call was €9 million provided by EuroNanoMed funding agencies and the second - € 8 million. As a result of their success it was decided to publish a third call which was launched in January 2011, resulting in eight projects, funded with € 8 million.

In total, these 24 funded research projects were selected out of the 100 submitted projects involving 500 research teams from 25 countries or regions, encompassing all three subfields of nanomedicine: targeted drug delivery, diagnostics and regenerative medicine.

In parallel, the non-technological innovation barriers were addressed, ranging from the regulatory aspects to concerns about safety in the field of nanomedicine. EuroNanoMed offered a unique platform for considering these issues at European level for further industrial exploitation of the research results and access to the market and published 2 reports on both safety aspects and regulatory questions in nanomedicine.

The strategic importance of nanomedicine is being increasingly recognised by governments and industry around the world

The high level of the submitted applications and excellent results of EuroNanoMed have ensured that it became a valued funding initiative in the field of nanomedicine.

In order to continue this successful work and to ensure a durable impact on the research programs involved, a second project proposal: ERA-NET EuroNanoMed II, is in preparation. If funded by the EC, a new call will be launched already in 2013.

Introduction

What is an ERA-NET?

The ERA-NET scheme (European Research Area Network), supported by the EC, aims at developing and improving the coordination of public research programs conducted at national or regional levels in Europe, providing a framework to explore and set up joint activities such as Joint Calls for Transnational Proposals. By reducing fragmentation, duplication of efforts and increasing the significant number of participants, the ERA-NET activities strengthen the European Research Area (ERA).

EuroNanoMed aims to bridge the gap between academic research and industrial applications

The Need

The ERA-NET EuroNanoMed (European Network of Transnational Collaborative RTD Projects in the Field of Nanomedicine) aims to bridge the gap between academic research in nanomedicine and industrial or clinical applications in order to shorten the time from bench to bedside.

With an ageing European population and increased demand for improved healthcare, further progress needs to be facilitated. Healthcare expenditure in industrialized countries accounts for 10% of the gross domestic product (GDP), a figure that is expected to rise. European countries invest a substantial amount of resources into developing the nanotechnology industry. Within this field, Nanomedicine, can be an advantage to medicine by its potential to bring about significant progress in diagnosis, prevention and treatment of diseases.

Nanomedicine

According to the Nanomedicine European Technology Platform, nanomedicine is defined as the application of nanotechnology to medicine, health and healthcare.

Nanomedicine exploits the improved and often novel physical, chemical and biological properties of materials at the nanometer scale and has the potential to enable early detection and prevention, and to essentially improve diagnosis, treatment and follow-up of diseases.

For example, Nanomedicine can improve in-vivo imaging techniques of medical equipment such as Magnetic Resonance Imaging (MRI) scans by means of new contrast agents or facilitate the integration of implants in the body. Nanoparticles can also help drugs to reach their target (e.g. cancer cells) more efficiently.

Over the last few years, Europe has been successful in basic research dedicated to nanotechnologies. However, within the Nanomedicine field, concerns remain among the RTD (Research and Technology Development) players as to their capability to move forward effectively from basic knowledge into either industrial or clinical applications, i.e. translational research.

EuroNanoMed

Funding organizations across Europe identified the need for a European initiative to coordinate research efforts and funding programs in nanomedicine.

The ERA-NET EuroNanoMed, supported by the European Commission for a three year period and coordinated by the CEA (France), was launched in January 2009. This initiative attracted the participation of as many as 24 research funding organizations (program owners and managers) from 15 EU Member States and Associate countries, as well as from three regions in Europe: Basque Region (Spain), France, Germany, Hungary, Iceland, Israel, Latvia, Lithuania, Poland, Portugal, Romania, Spain, Sweden, Switzerland, The Netherlands, Turkey, Veneto Region (Italy), and Walloon Region (Belgium).

EuroNanoMed aims at fostering the competitiveness of European nanomedicine contributors through the support of transnational collaborative and multidisciplinary RTD projects with participants from academia, clinical/public health communities, and industry, particularly small and medium-sized enterprises.

EuroNanoMed developed coordinated European-wide programs based on three joint transnational calls for proposals in nanomedicine

EuroNanoMed developed coordinated European-wide programs based on three joint transnational calls for proposals in nanomedicine. Identifying obstacles and barriers to joint activities and raising solutions to overcome the barriers were important strategic issues for the success of the transnational program. In addition EuroNanoMed contributed to the identification and analysis of legal and safety aspects in the field of nanomedicine.

The ERA-NET EuroNanoMed aspires to bridge the gap between academic research in nanomedicine and industrial or clinical applications in order to shorten the time from bench to bedside.

EuroNanoMed management

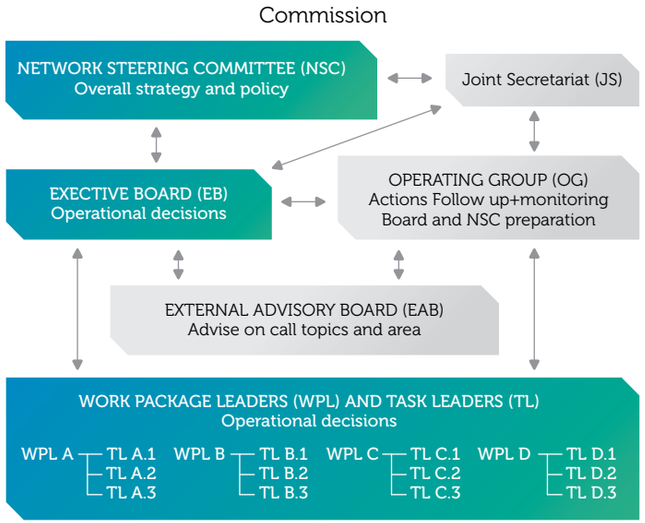
The Network Steering Committee (NSC) is the governing body of EuroNanoMed with overall responsibility for making all strategic decisions related to the initiative, monitoring the progress made towards defined goals, and providing the Executive Board with general strategic orientations. The NSC members are representatives of the partner organizations. The position of ENM NSC Chair was held by Professor Karin Nilsson from the Swedish Research Council, followed by

Dr. Olaf Rotthaus from VDI Technologiezentrum GmbH, Germany.

The Executive Board (EB) is responsible for the implementation of the project's activities; applying the necessary work to achieve objectives; reporting to the NSC and highlighting any appropriate proposals relevant to the strategy and conduct of the ERA-NET. The EB is chaired by the coordinator.

The Operating Group (OG) is composed of the coordinator, the NSC Chair and vice chair and the work package leaders. The OG members assist and advise the coordinator, preparing the NSC and EB meetings and suggesting appropriate solutions to any emerging questions during the preparation, the implementation and follow up of the EB and NSC activities. The first ENM coordinator was Dr. Pierre-Noël Lirsac who was replaced by Dr. Virginie Sivan, both from the Alternative Energies and Atomic Energy Commission (CEA), France.

The External Advisory Board (EAB) is composed of high-level external experts from European countries: two from academia, two from industry and two from the clinic. The EAB is involved in the strategic activities and priorities in order to help in delineating topics for the EuroNanoMed Joint Transnational Calls and other activities such as regulatory and safety issues.



Scheme of ERA-NET EuroNanoMed management

Expected Benefits to Citizens and Europe's Economy

Facilitating cross-fertilization between the different actors in nanomedicine was one of EuroNanoMed's prime objectives, aiming to accelerate the flow of information from research laboratories to end products for patients and to bridge the gap between life-enhancing/life-saving research and patient care. In addition, developing networks among the different research communities (academic, industry and clinical) will create synergies and improve the competitiveness of the European industry, which is very important in the worldwide competition in the field.

This will increase efforts towards achieving preclinical and clinical validations, which will shorten time to market of innovative products and the time for patients waiting to benefit from such advancements.

In line with Europe's vision of promoting a better standard of living and the opportunity of healthy ageing globally, this ERA-NET will directly benefit all EU Member States involved, Europe's neighbors (some of which are members of the consortium), and the world at large.

In a survey among all ENM applicants it was found that 98% of the EuroNanoMed applicants (out of 144 respondents) considered joint calls in nanomedicine were very useful for the research community. EuroNanoMed was considered as a "perfect complement to FP7 NMP calls" and "very important to improve translational research"

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INTERVIEW

Heico Frima

The Programme officer from the Directorate-General for Science & Innovation of the European Commission

Heico Frima was asked to point out some of the challenges that faced ERA-NET EuroNanoMed.

Heico Frima explained that one of the biggest challenges was to coordinate the 18 national and regional research funding bodies in the most efficient way. He explained the importance of coordinating the application procedures for the EuroNanoMed calls and deciding on how the topics were chosen and prioritized. Other challenges were managing the evaluations carried out by external experts; setting up a call office and creating a EuroNanoMed website. Heico Frima referred to the close cooperation of the EuroNanoMed consortium with the European Technology Platform (ETP) on Nanomedicine and how beneficial it was to this project. A major contribution to the success of the calls was the high standard of topics put forward to the Strategic Research Agenda.

Heico Frima stated that because EuroNanoMed succeeded in all its objectives, an additional third call for proposals was launched. The 3 joint calls resulted in 24 transnational research projects on nanomedicine funded under the umbrella of EuroNanoMed, with funding of € 25 million from its partner organizations and an additional € 21 million from the participating project partners. He remarked on how well the project was managed and implemented and that in reviewing the projects from the first two calls it could be seen that the funded projects were progressing well and carrying out very relevant work. In turn, these will hopefully develop into new diagnostics and therapies that may eventually benefit patients.

The 3 joint calls resulted in 24 transnational research projects on nanomedicine with funding of €25 million from its partner organizations and an additional €21 million from the participating project partners

In addressing the question of the main challenges that EuroNanoMed will potentially have to deal with in the next funding period, Heico Frima explained that EuroNanoMed was an excellent initiative and that EuroNanoMed II will be able to build on its achievements. He expressed the hope that the number of funded projects and participating countries and regions would grow, now that the scheme had become better known and the achievements were visible.

Finally, Heico Frima described the level of the multinational collaboration in the ERA-NET, as very high. The researchers involved appreciated the possibility for international cooperation and it provided them with better access to required expertise that was not available in their own country or region. Through this cooperation they gained more experience in cooperating with colleagues in other countries, learning about different cultures and research approaches and had the opportunity to expand their professional networks.

In conclusion Heico Frima remarked that while the process of getting nanomedicine products into the clinics is complex, long and expensive, the benefits to patients will be enormous. The exchange of information between the researchers, the funding organizations and various experts creates a better arena for the research to progress.

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EuroNanoMed Work Packages

The EuroNanoMed coordination activities and management functions were organized into five work packages (WP).

WP A:

Mapping of the ongoing national funding programs of the EuroNanoMed partners and Strategic Agenda for EuroNanoMed Joint Activities

The primary aim of this WP was to provide information and systematic benchmarking activities on partnering programs, to identify obstacles and barriers to joint activities and to raise solutions to overcome these barriers. It included four main tasks:

1. Exchanging national information: initiating regular updated inventories of the characteristics and processes of the national and regional funding programs of the EuroNanoMed partners.
2. Analyzing obstacles and barriers between partner programs for EuroNanoMed joint activities.
3. Designing a strategic agenda for joint activities (Joint Calls for Proposals).
4. Designing a proposal for future activities beyond the lifetime of EuroNanoMed.

WP B:

Establishment of the Framework for EuroNanoMed Joint Transnational Calls for Proposals

This work package was designed to provide the EuroNanoMed partners with a commonly agreed framework and procedures for Joint Transnational Calls for Proposals. In cooperation with an associated joint funding scheme consistent with applicable national legal rules it consisted of three main tasks:

1. Benchmarking the Joint Transnational Calls used in other ERA-NETs.
2. Designing the framework and procedures for the Joint Transnational Calls for applications, including the design of the international peer review evaluation procedures.
3. Analyzing the feedback from each Joint Transnational Call, to be used as an input for the planned ones to follow.

WP C:

Implementation of Common Joint Transnational Calls

This WP was designed to coordinate project proposals based on the process, procedures and documents defined in WP B and the analysis of the lessons learned. Its three main tasks included:

1. Setting up and activating a dedicated Call Office.
2. Implementing the common Joint Transnational Call for project proposals according to the strategic agenda.
3. Sending announcements of the EuroNanoMed Calls to the relevant audience.

WP D:

Non-Technological Innovation Barriers

This WP addressed non-technological innovation barriers, ranging from regulatory aspects to concerns about safety, for further industrial exploitation and market access in the field of nanomedicine. Within a global European market, it is essential to address this issue at a European rather than at a national level. The WP included three main tasks:

1. Organizing a workshop to identify, structure and prioritize the non-technological innovation barriers, focusing on regulatory affairs in the field of molecular imaging.
2. Implementing a market-oriented survey on regulatory affairs in molecular imaging to suggest options to overcome these barriers.
3. Mapping out nanomedicine related safety issues.

WP E:

Management of EuroNanoMed and Support

Management of all the administrative, technical, communication and economic aspects of the ERA-NET and strategic activities. It included four main tasks:

1. Coordinating the EuroNanoMed activities; preparing consortium meetings; managing the implementation of the EuroNanoMed activities and preparing progress reports.
2. Enabling communication with the European Commission on behalf of the consortium.
3. Establishing an External Advisory Board in order to advice the EuroNanoMed consortium on scientific issues and to help in delineating topics for the EuroNanoMed Joint Transnational Calls. This EAB was composed of high-level experts from European countries: 2 from academia, 2 from industry and 2 from clinics.
4. Creating a website dedicated to EuroNanoMed to ensure communication to a wide audience.

EuroNanoMed Strategic Agenda:

A Strategic Agenda for EuroNanoMed activities was published in 2009. The main aim of this document was to present the:

- EuroNanoMed initiative, its strategy, organization and foreseen joint activities
- Obstacles and barriers between the national funding programs participating in EuroNanoMed to joint research activities
- Current trends in Nanomedicine
- Global state of nanomedicine

Summary:

There is a global unmet need to cure and prevent diseases for which we currently lack efficient treatment modalities, and which causes suffering and a shortened life expectancy. The ageing population, the high expectations for improved life quality and the changing life style of European citizens also call for improved, more efficient and affordable health care. Nanomedicine, the application of nanotechnology in health care, offers numerous promising possibilities to significantly improve medical diagnosis and therapy, ultimately leading to a higher quality of life. Furthermore, nanomedicine is an important strategic issue for the sustainable competitiveness of Europe. The global competition in the field is very strong and the strategic importance of nanomedicine is being increasingly recognized by industry and governments around the world. Co-ordinated efforts at the European level are thus crucial to stay competitive.
The EuroNanoMed ERA-NET initiative comprises 24 partners from 18 countries or regions. EuroNanoMed aims at fostering the competitiveness of European nanomedicine players through the support of transnational collaborative and multidisciplinary research and technological development projects with participants from academia, industry and clinical/public health communities. The EU funds the extra costs incurred for the coordination of the joint activities of the national and regional funding organisations.

The EuroNanoMed ERA-NET initiative comprises 24 partners from 18 countries or regions

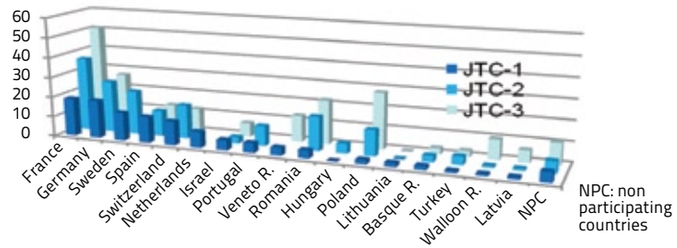
For the complete paper please visit this link:
www.euronanomed.net/files/Strategic_Agenda_for_EuroNanoMed.pdf

EuroNanoMed Joint Calls

EuroNanoMed launched three joint transnational calls for proposals (JTC) in nanomedicine in 2009, 2010 and 2011: the two original ones were planned in the initial strategic agenda of the ERA-NET while the third one was decided upon during the period of the ERA-NET, due to the prompt call launching process and the positive feedback from the participants.
The topics of the three calls covered the strategic priorities identified by the European Technology Platform on Nanomedicine: diagnostics, targeted delivery and regenerative medicine.
The aim of the calls was to support translational research proposals in the field of nanomedicine, encouraging transnational collaborations (at least three different countries) between researchers from academia, clinical sector and industry (with partners from at least two out of the three categories).
The evaluation of the projects was carried out based on external reviews from international experts and discussions by a joint peer review panel of international experts in order to establish the ranking list of best proposals.
The final budget of each funded project partner was negotiated and provided for by the relevant funding agency.

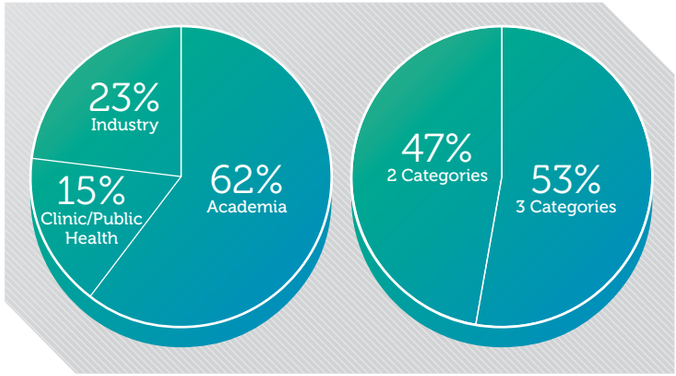
Results

In total, the three Joint Transnational Calls for Proposals generated the submission of almost 100 proposals (with an increased number of projects from one call to another) involving 500 research teams from 25 countries or regions (including EuroNanoMed and non EuroNanoMed countries/regions covering almost the whole European research community.



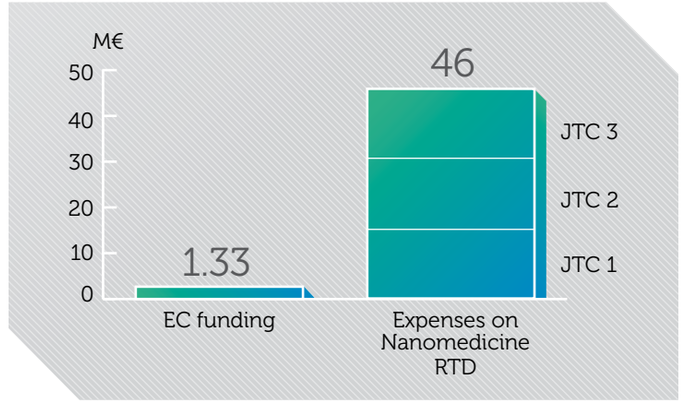
Number of applicants per country/region within submitted projects to the 3 Joint Transnational Calls for Proposals (JTC)

These projects generated transnational collaborations with research teams from academia, clinical and industry. In over half of the projects the three categories of research teams worked together. This cross-fertilization between the different partners (industry, clinical and academia) is a key point to enable basic research to enter into preclinical and first clinical stages in order to maximize the potential number of nanomedicine products to reach the market.



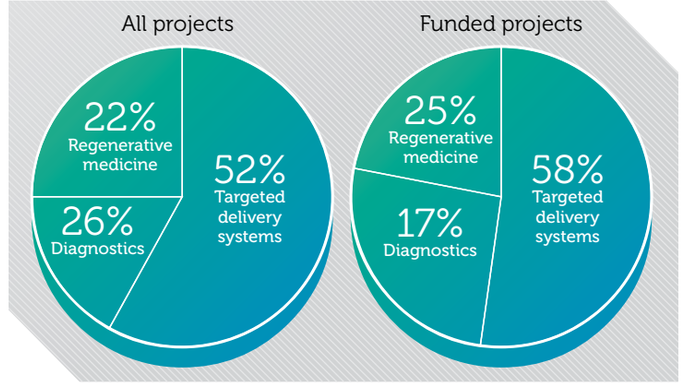
Distribution of the different categories of applicants within the submitted projects of the 3 calls

Through the three JTCs of years 2009, 2010 and 2011, EuroNanoMed funded 24 transnational research projects on nanomedicine involving 126 partners from 19 countries/regions (EuroNanoMed and non EuroNanoMed), with € 25 million funding from the member states and regions and a further € 21 million funding from the participating project partners.
EuroNanoMed generated a huge leverage effect for Nanomedicine, considering the EC budget dedicated to the coordination of the ERA-NET (€ 1.33 million) compared to the budget dedicated to Nanomedicine research through the funded projects (€ 46 million).



Relation between the budget invested by the EC for management (left) and budget dedicated to nanomedicine research, provided by both the EuroNanoMed funding agencies and the funded partners (right).

The 24 funded projects encompassed all three subfields of nanomedicine i.e. diagnostics, targeted delivery and regenerative medicine, covering diverse medical issues such as cancer; inflammatory diseases; cardiovascular diseases; Alzheimer's disease; infectious diseases as well as tissue regeneration of several organs, such as eyes, ears, spinal cords or bones.



Distribution of the projects through the main nanomedicine subfields

INTERVIEW

Professor Frank Barry

REMEDI - National University of Ireland, Galway, Ireland, Chair of the EuroNanoMed Peer Review Panels for the three Joint Calls.

What are the advantages of transnational research performed under the ERA-NET framework?

The advantages of this program are very clearly the quality of the applications, the innovative aspects of nanotechnology and nanomedicine that are embedded within the research projects, and the strong commercial focus.

Did you indentify differences between the calls?

I think that the quality of the proposals improved substantially during the 3 years. While the applications in the first year were very good, those that were reviewed in the most recent submission were really quite outstanding. Based on this observation I think we can expect the program to go from strength to strength.

What are the most outstanding achievements of the 1st call and 2nd call? Were there any difficulties?

There were very few difficulties. In the first round there were some applications that were some distance from the theme of the call and this was resolved by the second round.

I have been involved in many reviews in Europe and North America and several things impressed me greatly about this particular initiative. The entire management, including the call for proposals, the submission process and the review process, was quite outstanding. I understand very well the complex nature of this operation and the need for a highly organized and dedicated management team. This was very much in evidence with the ENM initiative. In addition, I was struck by the efficiency of the review process. Each committee of reviewers consisted of acknowledged leaders

"There is no doubt that this tran-snational initiative will achieve the desired outcome of clinical ap-plicability and commercial development".

in the field and each proposal was evaluated with clarity and impartiality. At the end of each review meeting there was a strong sense of satisfaction that the evaluation was rigorous and that the best projects were selected.

Can you give a specific example of a successful research project?

The project Nanostem struck me as being really quite innovative and likely to have a very significant impact. The project focuses on the cancer stem cells which are present in many solid tumors and which are associated with metastatic disease. The objective is to devise anti-cancer treatments that target the cancer stem cells. This is scientifically insightful as well as therapeutically important. It is likely that this project – and there are others – will have a strong impact in clinical care and translation.

What are the expected outcomes of the projects in which industry and academia collaborate? How is the intellectual property issue resolved?

The projects have a strong transnational focus and involve partners in industry. This is an important advantage of EuroNanoMed. Intellectual property will be managed by means of a research agreement signed by all the parties which allows background IP to be protected and foreground IP to be shared. A likely part of this will be an option agreement whereby the industry partners can have first rights for a period of time.

What are the challenges facing collaborations between the industry and academia?

There are many challenges in collaborations between industry and academia. It is not uncommon for academic researchers to resist the idea of industry partnerships because they mistakenly believe that it impinges on the "purity" of their research. This is a misapprehension however,

which is disappearing. A second aspect concerns speed and delivery. Successful companies generally operate on tight timelines and expect to meet deadlines and milestones. The pace of academic effort may sometimes be slower. Thirdly, the need for compliant laboratory management, document control and good laboratory practice, which are standard in industrial laboratories, are often a challenge in an academic environment.

Are there any results with clinical relevance?

Many of the projects will have clinical relevance with either a therapeutic or a diagnostic outcome.

Finally, I would like to make the following point. I have had an opportunity to review progress of the proposals funded in the first call. The quality of science, innovation and delivery are all exceptionally good. There is no doubt that this transnational initiative will achieve the desired outcome of clinical applicability and commercial development. The EuroNanoMed initiative is certain to enhance European competitiveness in nanotechnology and nanomedicine and will lead to significant economic development.

"The EuroNanoMed initiative is certain to enhance European competitive-ness in nan-otechnology and nanomedicine and will lead to significant economic development".

First Joint Call

In May 2009, the first Joint Call for proposals was launched with the participation of 19 EuroNanoMed funding agencies (from 17 countries/regions). Twenty four applications were submitted from 117 research groups. The proposals involved the majority of partners from the participating countries, but also from non participating countries such as Denmark and Italy.

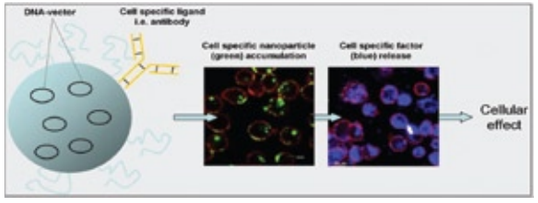
Finally, eight projects involving 40 research groups from 14 countries/regions were funded with € 9 million provided by EuroNanoMed funding agencies.

Funded Projects JTC-1

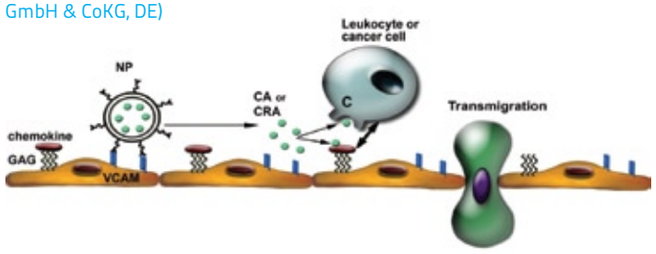
Acronym	Full Title	Coordinator	Coordinating Country
DENANORNA	Dendrimers as nanovectors for targeted siRNA delivery in gene therapy	Ling Peng (Centre National Recherche Scientifique)	France
Nano4Neuro	Nano-Functionalised Implants for the Regenerative Treatment of Spinal Cord and Nerve Lesions	Burkhard Schlosshauer (Natural and Medical Sciences Institute at the University of Tübingen)	Germany
LYMPHOTARG	Lymphonano carriers for the treatment of metastatic cancer	Maria José Alonso Fernández (University of Santiago de Compostela)	Spain
I-CARE	Integrative Nano-Composites and Regeneration of the Eye	May Griffith (Linköpings University)	Sweden
EAREG	Ear Tissue Regeneration Using Human Cells and Novel Nano-Cellulose Scaffolds	Paul Gatenholm (Chalmers University of Technology)	Sweden
TARGET-PDT	Photo Dynamic Therapy using photosensitizer-doped targeted organic nanoparticles	Patrick Boisseau (CEA – Commissariat à l'énergie atomique)	France
DENPEPTHIV	Peptides-associated dendrimers in dendritic cells for the development of new nano-HIV vaccines	Mª Angeles Muñoz Fernández (Hospital General Universitario Gregorio Marañón)	Spain
NANOSTEM	Targeting Combined Therapy to Cancer Stem Cells	Simó Schwartz Jr (CIBER-BBN)	Spain

Second Joint Call

The second Joint Transnational Call for Proposals was launched by ERA-NET EuroNanoMed in March 2010 with the participation of 17 EuroNanoMed funding agencies from 16 countries/regions.
A total of 33 projects were submitted, involving 178 applicant groups from 19 EU members and associated states/regions.
Finally, eight projects involving 46 partners from 10 countries/regions were funded with € 8 million provided by EuroNanoMed funding agencies.



An illustration from the NanoGene project. Stem cell generation and manipulation by nanoparticle mediated gene transfer for the safe clinical application of gene-modified cells. Coordinator: Christine Günther (Apceth GmbH & CoKG, DE)



An illustration from the NANODIATER project. Nanoparticles designed to target chemokine-related inflammatory processes in vascular diseases and cancer metastasis and implementation of a biosensor to diagnose these disorders. Coordinator: Maya Simionescu (Institute of Cellular Biology and Pathology "N. Simionescu", RO)

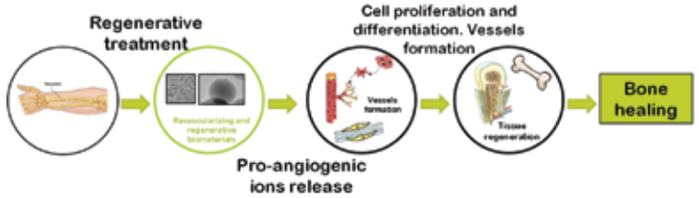
More detailed information about the funded projects can be found in the ENM website: http://www.euronanomed.net/

Funded Projects JTC-2

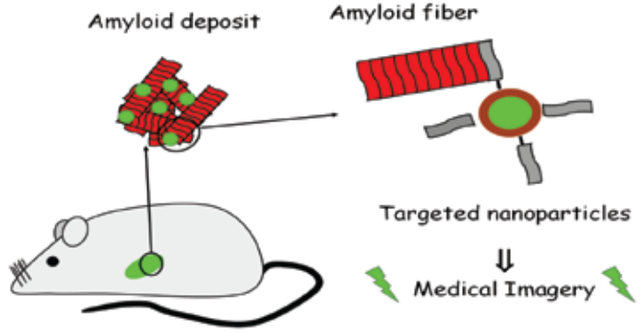
Acronym	Full Title	Coordinator	Coordinating Country
BIBA	Delivering nanopharmaceuticals through Biological Barriers	Patrick Boisseau (CEA – Commissariat à l'énergie atomique)	France
HCVAX	Development of a Hepatitis C vaccine by targeted delivery of nanogel RNA-replicon constructs	Ken McCullough (Institute of Virology and Immunoprophylaxis)	Switzerland
iNanoDCs	Design of multifunctional nanoparticles targeting TLR or Nod receptors for dendritic cell immune therapy	Bernard Verrier (Centre National Recherche Scientifique)	France
NANOASIT	Novel drug delivery routes mediated via nanotechnology; targeting allergy vaccination	May Griffith (Linköpings University)	Sweden
NANODIATER	Nanoparticles designed to target chemokine-related inflammatory processes in vascular diseases and cancer metastasis and implementation of a biosensor to diagnose these disorders	Maya Simionescu (Institute of Cellular Biology and Pathology " N. Simionescu")	Romania
NanoGene	Stem cell generation and manipulation by nanoparticle mediated gene transfer for the safe clinical application of gene-modified cells	Christine Günther (Apceth GmbH & CoKG)	Germany
NanoSplice	Nanoconstructs for delivery of RNA splice-switching oligonucleotide therapeutics	Edvard Smith (Karolinska Institutet, Department of Laboratory Medicine)	Sweden
REBONE	Hybrid Nanostructured Hydrogels: Bone regeneration using multifunctional injectable hydrogels	José Domingos Silva Santos (Biosckin Molecular and Cell Therapies S.A.)	Portugal

Third Joint Call

An additional call was planned and the third JTC was launched in January 2011, with the participation of 14 EuroNanoMed funding agencies. There were 41 applications involving 207 groups from 20 EU members and associated states/regions (EuroNanoMed and non EuroNanoMed countries/regions).
Finally, eight projects, involving 40 partners from 11 countries were funded with € 8 million provided by EuroNanoMed funding agencies.



An illustration from the nAngiofrac project. Angiogenic nanostructured materials for non-consolidating bone fractures. Coordinator: Josep A. Planell (Biomedical Research Networking center in Bioengineering, Biomaterials and Nanomedicine-CIBER-BBN, ES)



An illustration from the Dia-AMYL project. Amyloid Peptide Grafter to gd-nanoparticle for amyloidosis diagnosis. Coordinator: Vincent Forge (Commissariat à l'Energie Atomique et aux Energies Alternatives-CEA, FR)

More detailed information about the funded projects can be found in the ENM website: http://www.euronanomed.net/

Funded Projects JTC-3

Acronym	Full Title	Coordinator	Coordinating Country
CheTherDel	Chemo-hyperthermal Delivery - Combined chemo-hyperthermal control of hepatic tumors, based on microwave-activated subendothelial-targeted nano-assemblies	Mihail-Gabriel Dimofte (University of Medicine and Pharmacy „Gr.T. Popa" Iasi)	Romania
Dia-AMYL	Amyloid Peptide Grafter to gd-nanoparticle for amyloidosis diagnosis	Vincent Forge (Commissariat à l'Energie Atomique et aux Energies Alternatives-CEA)	France
FONDiag	Fluorescent Organic Nanocrystals for the Early Diagnosis of Esophageal and Colon Cancer	Suzanne Fery-Forgues (Laboratoire IMRCP-CNRS UMR 5623)	France
META	Metastases Targeting Aptamers	Günter Mayer (University of Bonn)	Germany
nAngioFrac	Angiogenic nanostructured materials for non-consolidating bone fractures	Josep A. Planell (Biomedical Research Networking center in Bioengineering, Biomaterials and Nanomedicine-CIBER-BBN)	Spain
NanoDiaMed	Molecular diagnosis of multifactorial psychiatric diseases: functional validation of identified gene variants using nanobodies coupled to fluorescent diamond nanoparticles	Michel Simonneau (Institut National de la Santé et de a Recherche Médicale-INSERM)	France
NANOVAXID	Design of novel anti-idiotype vaccines adjuvanted with RNA-based nanoparticles: entry into nanotechnology based personalized cancer immunotherapy	Maurizio Bendandi (Clínica Universidad de Navarra-CUN)	Spain
STRUCTGEL	Nanostructured Gel for Cellular Therapy of Degenerative Skeletal Disorders	George Altankov (Biomedical Research Networking center in Bioengineering, Biomaterials and Nanomedicine-CIBER-BBN)	Spain

INTERVIEW

Professor Patrick Boisseau

Professor Patrick Boisseau has been involved in three ENM projects in the first two Joint Calls, as coordinator of two projects and as a PI of the third one. He was also a member of the Peer Review Panel for the third Joint Call.

Looking back at the first 2 years of funding, what are the main scientific achievements of your research project?

I've been involved in 3 ENM projects, two as coordinator - TARGET-PT and BIBA - and one as contributor – NanoSTEM. In the TARGET-PDT project, we demonstrated the superior in-vitro of nano-encapsulation of a panel of photosensitizer, well beyond the commercial products. In NanoSTEM, we have very significantly improved the payload of a chemotoxic drug into nanocarriers by adapting the formulation. The in-vitro tests will show the benefits for future therapy. The BIBA project only started this year and there are no significant achievements so far.

What is the clinical relevance of your consortium's research?

Firstly, clinicians know better than anyone the clinical needs, and secondly they usually possess the cell or animal models for a given pathology, so that experimental proof of concept can be demonstrated on the best models. I've been lucky enough in having some very open minded clinicians in my consortia, who are open to technological developments.

As a funded scientist and also as a review panel member, what, in your opinion, are the main achievements of ENM?

ENM is an outstanding funding tool for nanomedicine in Europe. It is fast, efficient, light and innovative. It fills a huge gap in funding nanomed projects by providing fast allocation of seed funding for innovative ideas and concepts, where a limited number of partners are required. ENM is highly complementary to FP7 large scale projects that provide higher funding but with a complicated and long application process.

How do you see the future of EuroNanoMed?

ENM should continue as a new scheme, as nanomedicine is now emerging with some highly promising concepts and technologies. Their translation to the clinics and to industry requires extra effort in the next 3-4 years to secure their proof of concept. Then industry will support the validation, development and scale up.

"ENM is an outstanding funding tool for nanomedicine in Europe. It is fast, efficient, light and innovative"

"ENM is highly complementary to FP7 large scale projects that provide higher funding but with a complicated and long application process".

Non-Technological Innovation Barriers: Safety and Regulatory Issues in Nanomedicine

To successfully transform innovative research to the market, stakeholders usually have to surmount a number of obstacles. In addition to technical hurdles which are inherent to scientific research, there are "non-technological barriers" that may hinder market access of R&D results. One major non-technological barrier in the healthcare sector is the challenging regulatory framework that makes market approval of new drugs time demanding and costly.

This is especially true for nanomedicine, as nanomedical products are often on the borders between medical products and pharmaceuticals and therefore are subjected to different regulatory frameworks. This fact is the source of uncertainties with regard to market accreditation.

Regulatory frameworks should be discussed on a European rather than at a national level. In this context, EuroNanoMed offered a unique platform to deliberate regulatory issues that will facilitate the transfer of nanomedicine knowledge from the laboratory to the patient.

Two reports that addressed these issues were published by EuroNanoMed:

1. A synthetic report summarizing the main information regarding safety aspects in nanomedicine is available on the web site: www.euronanomed.net/files/D2-WPD_wrap%20up%20safety%20issues%2031052010-FINAL.pdf
2. A report presenting the conclusions of an expert workshop "Non-Technological Innovation Barriers" dedicated to regulatory questions in Molecular Imaging. The field of molecular Imaging was chosen as an exemplary subfield of nanomedicine due to its importance to both therapeutic and preventive medicine and, accordingly, its impact on therapy costs and reimbursement. The workshop aimed to define common interests between clinicians, producers of medical devices and imaging agents as well as regulatory agencies. It also set out to establish a fruitful co-operation in finding rapid and practicable solutions for regulatory problems and achieving a reasonable regulatory framework for imaging agents. Twenty five international experts from industry, public research, clinical and medical product agencies attended the workshop. The report summarizing the main issues and recommendations raised by the experts is available on the website: www.euronanomed.net/files/EuroNanoMed_Workshop_Non-Technological_Innovation_Barriers.pdf

Main Meetings and Workshops

Two experts' workshops were dedicated to the definition of the scientific topics for the EuroNanoMed Joint Transnational Calls for Proposals:

External Advisory Board workshop for EuroNanoMed Call topics 2009, March 2009, Brussels, Belgium:

Members of the EuroNanoMed External Advisory Board were invited to discuss and make recommendations on the topics of the first EuroNanoMed Transnational Call for Proposals. The EAB is composed of six high-level experts in nanomedicine from academia, industry and clinics, covering the three main areas of nanomedicine; drug delivery, diagnostics and regenerative medicine. The EAB is involved in the strategic activities and priorities of EuroNanoMed in order to help in delineating topics for the Joint Transnational Calls. During this meeting EuroNanoMed objectives and work packages were presented and the comments and advice from the EAB were taken into account for writing the call text while keeping the topics as broad as possible to attract more applicants.

Expert workshop for EuroNanoMed Call topics, February 7-9th, 2010, Reykjavik, Iceland:

This expert workshop involved an analysis of the evolving field of Nanomedicine. The aim was to ensure that the scope of the EuroNanoMed calls are kept in line with the academic, industrial, health, and clinical needs, along with the developments in nanomedicine during the time frame of the EuroNanoMed ERA-NET.

The workshop brought together 16 scientists with industrial, academic or clinical backgrounds, including the EAB members. Four selected nanomedicine topics were discussed in group sessions: diagnostics; drug delivery; regenerative medicine and clinical/industry needs, in order to give insights into possible strategic priorities concerning actions, training or research in the field. The aim of this analysis was to map strengths and weaknesses of the European community in nanomedicine, pointing out the relevant areas to be addressed in the second EuroNanoMed call for proposals to be launched in 2010.

Non technological innovation barriers in the field of molecular imaging December 14-15th 2009, Düsseldorf, Germany:

The main objective of the workshop was to enable - on an European level - a well built dialogue between clinicians, producers of medical devices and imaging agents together with regulatory organizations, in order to address regulatory issues in nanomedicine, in particular in the field of molecular imaging. Twenty five international experts attended the workshop.

During the two day workshop, the experts identified a number of bottle-necks in existing regulations and formulated recommendations as to how to refine the existing guidelines to improve and accelerate the approval of imaging agents. A report summarizing the main issues and recommendations raised by the experts is available on the EuroNanoMed website at:
www.euronanomed.net/files/EuroNanoMed_Workshop_Non-Technological_Innovation_Barriers.pdf

Mid term review meeting of the projects funded in 2009, November 15-16th 2011 Bern, Switzerland.

This meeting was the first midterm review meeting of EuroNanoMed aimed at reviewing the projects funded in 2009 through the first EuroNanoMed joint transnational call for proposals. The coordinators of the eight projects funded in 2009 presented the objectives, first results and any difficulties encountered in their projects. A poster session was also organized, providing the 12 young researchers with an opportunity to present, in more detail, specific parts of their projects. In order to foster communication between researchers, the coordinators of the eight projects funded in 2010 were also invited to participate in this meeting with a brief presentation of their projects. A total of 60 people attended the meeting, including researchers involved in the funded projects, representatives of the EuroNanoMed funding agencies, a representative of the European Commission and three expert members of the EuroNanoMed peer review panel.

The oral presentations and the poster exhibition enabled the PRP members to receive feedback on their funding recommendations.

Papers to review are:
Strategic Agenda for EuroNanoMed
www.euronanomed.net/files/Strategic_Agenda_for_EuroNanoMed.pdf

Nontechnological Innovation Barriers
www.euronanomed.net/files/EuroNanoMed_Workshop_Non-Technological_Innovation_Barriers.pdf

Safety Issues in Nanomedicine:
www.euronanomed.net/files/D2-WPD_wrap%20up%20safety%20issues%2031052010-FINAL.pdf

Dissemination Activities

Press Conference:

April 23rd 2009: A press conference hosted by the Veneto Region Offices in Brussels was organized in order to promote the launch of the 1st EuroNanoMed Joint Transnational Call for Proposals.

Mr. Gianlorenzo Martini, Director of Veneto Region Brussels Office opened the press conference.

The speakers were: Mr. Christos Tokamanis, Head of Unit, Operational Unit Nanosciences and Nanotechnologies, European Commission - DG RTD: **"Nanosciences in the European Research Area: What are the Challenges for the future?"**

Karin Forsberg Nilsson, EuroNanoMed NSC Chair, Deputy Secretary General Scientific Council for Medicine, Swedish Research Council: **"The EuroNanoMed Project: an asset for the development of nanomedicine in Europe"**

Presentations and Posters

- **European Technology Platform on Nanomedicine (ETPN) General Assembly, May 2009, Münster, Germany**
  Presentation: "EuroNanoMed: launch of the 1st Joint Transnational Call for Proposals" Pierre-Noël Lirsac, Coordinator of EuroNanoMed, CEA, France.
- **Proposers' Day and Partnering Event on Nanomedicine, April 12th 2010, Berlin, Germany.**
  The ETP Nanomedicine organized a proposers' day and partnering event targeting nanomedicine research in the perspective of several relevant European calls in 2010, namely, FP7 and EuroNanoMed ERA-NET.
  Presentation: "EuroNanoMed: Launch of the Second Joint Transnational Call for Proposals"
  Olaf Rotthaus, EuroNanoMed NSC chair, VDI, Germany
  www.etp-nanomedicine.eu/public/press-documents/press-articles/successful-proposers2019-day-and-partnering-event-on-nanomedicine-in-berlin
- **European Technology Platform on Nanomedicine (ETPN) General Assembly, October 2010, Milan, Italy**
  Presentation: "European funding instrument in nanomedicine: EuroNanoMed"
  Virginie Sivan, Coordinator of EuroNanoMed, CEA, France
  www.dailymotion.com/video/xg4e3y_virginie-sivan-european-funding-instrument-in-nanomedicine_tech
- **European Research Area (ERA) - Platform Meeting of ERA-NETs related to ERA-IB and the KBBE, November 2010, Dresden, Germany**
  The aim of this meeting was to exchange information and experiences with different ERA-NETs with regard to the general organization of ERA-NETs, the joint activities and the follow up of the funded projects. The possibilities of sustainable joint multinational research activity were also discussed
- **NanotechItaly, November 2010, Venice, Italy**
  Poster: "For your transnational projects in nanomedicine, think EuroNanoMed"
  EuroNanoMed Call Office, Veneto Nanotech, Italy
  www.nanotechitaly.it/
- **European Technology Platform on Nanomedicine (ETPN) General Assembly, October 2011, Barcelona, Spain**
  Poster: "EuroNanoMed Funding of transnational research projects in Nanomedicine"
  Virginie Sivan, Coordinator of EuroNanoMed, CEA, France
  www.etp-nanomedicine.eu/public/news-events/events/etp-nanomedicine-general-assembly-annual-forum-2011

Press Releases:

- April 24th 2009: EuroNanoMed: Launch of the first ERA-NET Call for Proposals in the field of Nanomedicine
- October 29th 2009: EuroNanoMed promotes European collaborations and innovations in Nanomedicine
  www.euronanomed.net/files/press%20release%20EURONANOMED.pdf
- November 9th 2010: ERA-NET EuroNanoMed Allocates € 8 Million to European Transnational Research Projects in Nanomedicine
  www.euronanomed.net/index.php?option=com_content&view=category&layout=blog&id=4
- November 2nd 2011: EuroNanoMed Allocates € 8 Million to European Transnational Research Projects in Nanomedicine
  www.euronanomed.net/files/EuroNanoMed%20press%20release%20JTC2-results-VFx.pdf

Other publications:

- ENM newsletter number 1
  www.euronanomed.net/files/Newsletter%20EuroNanoMed.pdf
- ENM newsletter number 2
  www.euronanomed.net/files/Newsletter%20EuroNanoMed%202011.pdf
- "For your Transnational Projects in Nanomedicine, think EuroNanoMed!" European Research Review journal, November 2009, page 15:
  http://viewer.zmags.com/publication/cc5cc0b9#/cc5cc0b9/14
- "EuroNanoMed", ERA-NET - Networking the European Research Area Series II, EC publication, May 2010, page 13:
  http://cordis.europa.eu/fp7/coordination/library_en.html

EuroNanoMed Partners in the final meeting of the Network Steering Committee and Executive Board, Bern, Switzerland, November 16th 2011.

Towards EuroNanoMed II...

EuroNanoMed has become to be a well recognized funding initiative in the field of nanomedicine. In order to continue the successful work performed in EuroNanoMed and to have a durable impact on the research programs involved, a second ERA-NET project proposal: ERA-NET EuroNanoMed II is in preparation. If funded by the EC, a new call will be launched already in 2013.

EuroNanoMed Partners

The EuroNanoMed consortium reflects the huge interest and expectations generated by the EuroNanoMed Initiative. It includes 24 partners (Ministries and Funding Agencies) from 15 countries and 3 regions:

BELGIUM (WALLOON REGION)

Service public de Wallonie / Direction générale opérationnelle Economie, Emploi et Recherche (SPW).
http://recherche-technologie.wallonie.be/

FRANCE

Atomic Energy Commission (CEA)/COMMISSARIAT ENERGIE ATOMIQUE CEA.
www.cea.fr/
Agence nationale de la Recherche (ANR).
www.agence-nationale-recherche.fr/

GERMANY

Federal Ministry of Education and Research (BMBF).
www.bmbf.de/en/index.php
VDI Technologiezentrum GmbH (VDI).
www.vditz.de/

HUNGARY

National Office for research and technology (NKTH).
www.nkth.gov.hu/english

ICELAND

The Icelandic Centre for Research (RANNIS).
www.rannis.is/english/frontpage/

ITALY

Regione del Veneto - Project Unit Research and Innovation
www.regione.veneto.it
Veneto Nanotech s.c.p.a. (Veneto Agency).
www.venetonanotech.it

ISRAEL

Ministry of Health, The Chief Scientist Office (CSO-MOH).
www.health.gov.il/

LATVIA

Latvian Academy of Sciences (LAS).
www.lza.lv/index.php?mylang=english

LITHUANIA

Research Council of Lithuania (RCL).
www.lmt.lt

POLAND

National centre for research and development (NCBIR).
www.ncbir.pl

PORTUGAL

National Science Foundation (FCT).
http://alfa.fct.mctes.pt/

ROMANIA

National Authority for Scientific research (ANCS).
Read more on ANCS.
www.mct.ro/
The Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI).
www.uefiscdi.ro/

SPAIN

Fondo de Investigación Sanitaria (FIS) Instituto de Salud Carlos IIII (ISCIII).
www.isciii.es/htdocs/en/index.jsp

SPAIN (Basque region)

Industry, Trade and Tourism Department- Basque Government (ITT).
www.euskadi.net/industria
INNOBASQUE Parque Tecnológico de Bizkaia (INNOBASQUE).
www.innobasque.com

SWEDEN

Swedish Research Council (SRC).
www.vr.se
VINNOVA.
www.vinnova.se

SWITZERLAND

Swiss National Science Foundation (SNF).
www.snf.ch/D/Seiten/default.aspx

THE NETHERLANDS

SenterNovem.
www.senternovem.nl/english/

TURKEY

The Scientific and Technological Research Council of Turkey (TUBITAK).
www.tubitak.gov.tr

Contacts

EuroNanoMed call Office
Veneto Nanotech s.c.p.a.
Via San Crispino, 106
35129 Padova – Italy
Tel.: +39 049 7705520
mailto: calloffice@euronanomed.net

EuroNanoMed Coordinator and Executive Board Chair:
Dr. Virginie Sivan
Commissariat à l'Energie Atomique (CEA), France
Tel.: +33 1 69 08 87 99
Email: Virginie.sivan@cea.fr
Virginie.sivan@cea.fr

Network Steering Committee Chair:
Dr. Olaf Rotthaus
VDI Technologiezentrum GmbH, Germany
Tel.: +49 211 6214-233
Email: rotthaus@vdi.de

For more information, visit the EuroNanoMed web site:
http://www.euronanomed.net/

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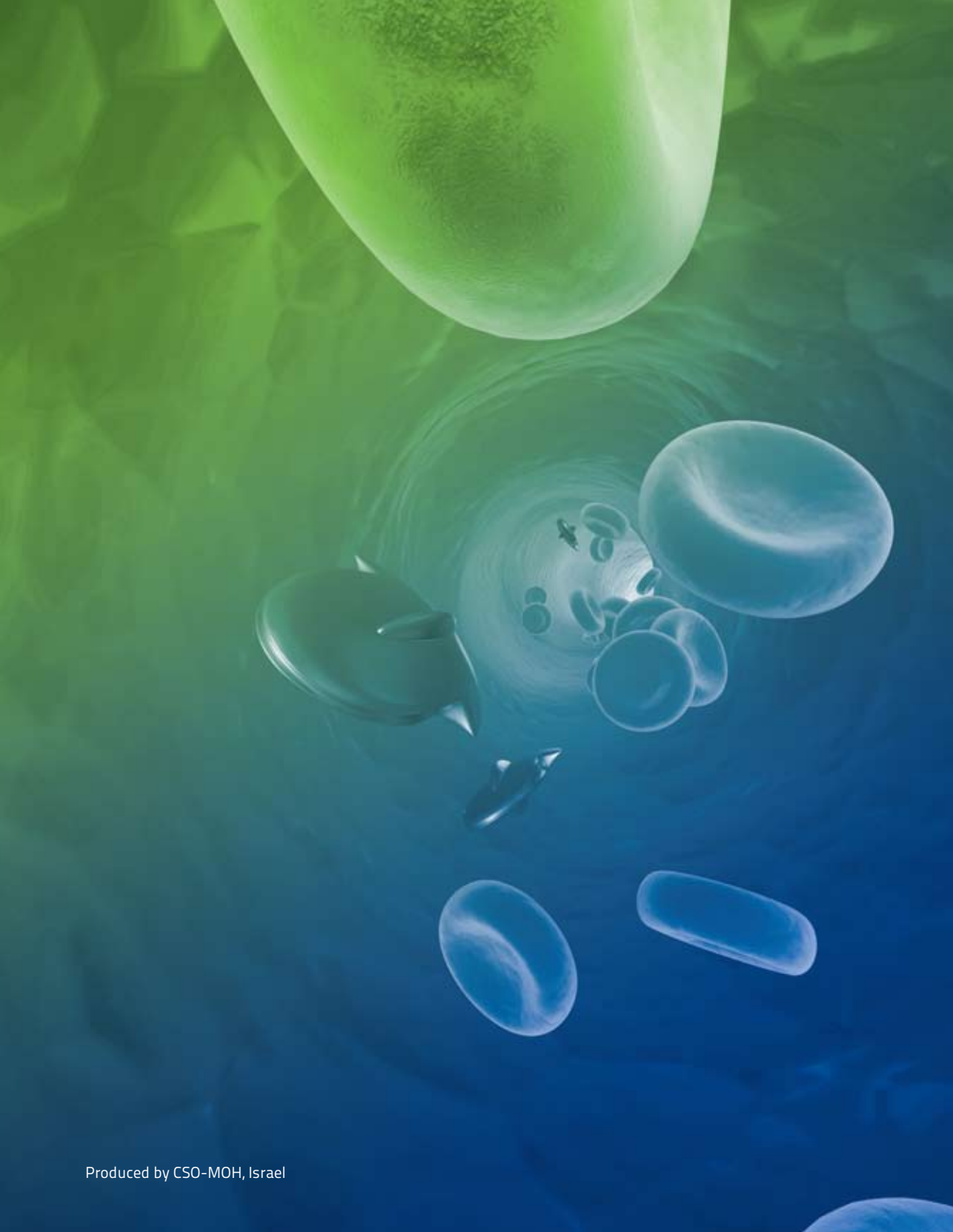
Full title: EUROpean network of trans-national collaborative RTD in the field of NANOMEDicine
EC contribution: € 1,332,494
Duration: 1 January 2009 - 31 December 2011



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