

# EuroNanoMedII

Analysis of the  
EuroNanoMedI first joint  
transnational call (2009)



EuroNanoMed2



# What is EuroNanoMed II

EuroNanoMed II is an ERA-NET comprising 20 partners from 17 countries/regions, that has been granted for funding through the European Commission's 7th Framework Programme (2012-2016).

The ERA-NET serves as a platform for funding agencies and ministries to develop joint activities and programmes in order to coordinate high quality research across national borders.

EuroNanoMed II builds on the achievements of its predecessor, the EuroNanoMed ERA-NET, which was funded by the European Commission from 2009 to 2011. Through 3 joint calls for proposals, EuroNanoMed granted 24 transnational research projects on Nanomedicine with a total funding of €25 million from its partner organizations and an additional €21 million from the participating project partners.

The aim of EuroNanoMed II is to continue fostering the competitiveness of European nanomedicine actors through the support of transnational collaborative and multidisciplinary research and technology development projects with participants ranging from academia, clinical/public health communities, and industry (particularly small and medium-sized enterprises). Among the most important activities of EuroNanoMed II are annually launched joint transnational calls for proposals for research groups operating in the EuroNanoMed II partner countries and follow-up of projects funded under the previous calls in ENM I & II.

The projects funded under the 1<sup>st</sup> transnational call 2009 have now been concluded and the results of this call are described below.

## 1<sup>st</sup> Joint Transnational Call 2009

**24** Projects were submitted to JTC- 2009

**8** Projects were funded

Total cost of the funded projects  
**€16.9M**

Allocated funding  
**€9M**

**62%**  
"Targeted delivery system" projects

**38%**  
"Regenerative medicine" projects

## Projects Funded under EuroNanoMed JTC - 2009

Acronym	Project full name	Countries	Project coordinator
DENANORNA	Dendrimers as nanovectors for targeted siRNA delivery in gene therapy	FR, IT, ES, CH	Ling Peng (FR)
Nano4Neuro	Nano-Functionalised Implants for the Regenerative Treatment of Spinal Cord and Nerve Lesions	DE, FR, SE, DK	Burkhard Schlosshauer (DE)
LYMPHOTARG	lymphonanocarriers for the treatment of metastatic cancer	ES, FR, IT	Maria José Alonso Fernández (ES)
I-CARE	Integrative nano-Composites And Regeneration of the Eye	SE, IL, LT, DE	May Griffith (SE)
EAREG	Ear Tissue Regeneration Using Human Cells and Novel Nano-Cellulose Scaffolds	SE, DE, NL, CH	Paul Gatenholm (SE)
TARGET-PDT	Photo Dynamic Therapy using targeted organic nano particles	FR, CH, DE	Patrick Boisseau (FR)
DENPEPTHIV	Peptides-associated dendrimers in dendritic cells for the development of new nano-HIV vaccines	ES, FR, PL, DE	Angeles Muñoz Fernandez (ES)
NANOSTEM	Targeting Combined Therapy to Cancer Stem Cells	ES, PT, FR	Simo Schwartz Jr (ES)

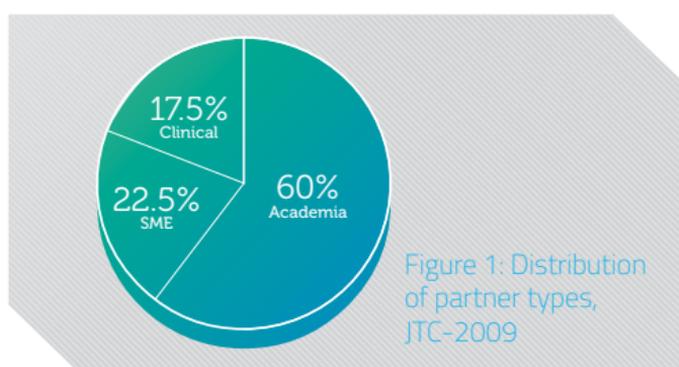


Figure 1: Distribution of partner types, JTC-2009

**Networking:** 66 project meetings were held during the lifetime of the program (average 8.2 per project). Consortia or members that were funded under JTC-2009 also submitted 13 proposals to other European calls. Three of these were applications to a subsequent EuroNanoMed Call. The most prolific consortium submitted four applications.

**Young researchers** (defined as a researcher who has received his/hers PhD less than 10 years prior to the call deadline): 73 young researchers were involved in the eight projects (average 9.1 Young researcher per project).

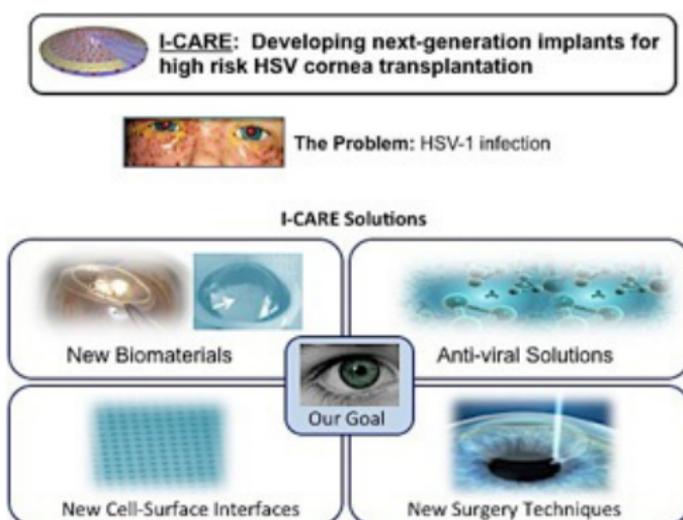
**Mobility and researcher exchange:** Half of the projects led to longer term-mobility, which ranged between weeks to six months.

(tissue reconstruction) and nanolaser surgery. We developed and optimized nano-composite, hydrogel-based implants with multi-scale 3D architectures, which once implanted stimulate the body's own stem cells to rehabilitate the damaged cornea.

A robust interpenetrating network consisting of recombinant human collagen and phosphorylcholine was optimized for use in high-risk transplants. Immediately following the conclusion of I-CARE, a pilot study was conducted and a clinical trial is scheduled to begin in July 2014. The formulation was also altered to produce a more elastic prototype implant that is based on nanoparticulate carriers loaded with drugs or components from the innate immune system, e.g. cationic anti-viral peptide, LL37, to prevent viral reactivation and circumvent further inflammation-mediated damage to the eye. Since HSK is capable of depleting the healthy stem cell pool while it remains latent within the cornea and nerves, we also developed techniques to render the therapeutic replacement cells "viral resistant" through the transfer of LL37 genes to the cells.

We also developed methods for nanolaser surgery followed by tissue-welding to avoid the more traumatic manual surgery currently employed to prevent reactivation of latent viruses in HSK-infected corneas. In addition, we developed a method for patterning the hydrogels to modulate cell behavior.

Overall, these technologies will hasten the introduction of regenerative treatments for corneal HSK and other high-risk transplants to the clinic. In 2013, the "I-CARE" project received the European Technology Platform on



Nanomedicine (ETPN) award in the regenerative medicine category.

UAB Ferentis ([www.ferentis.eu](http://www.ferentis.eu)), a Lithuanian company launched from the I-CARE project was recently named the Best New Company at the European Life Science Awards 2014.

### **Why was the 2009 call successful? \_**

- A high number of young researchers were involved (**73**);
- A high dissemination level (**147** conferences, **70** peer review articles, **25** dissertation theses, **32** books (chapters) and reviews, and **18** articles to general public) were generated from JTC-2009 projects;
- **24** contracts and fellowships were extended and **42** new contracts and fellowships were created. **5** permanent contracts were created;
- **5** patents were submitted and **1** company was created

## **A Case Study: Integrative Nano-Composites and Regeneration of the Eye (I-Care)**

**Prof. May Griffith from Linköping University, Sweden, former I-Care project coordinator, summarized the project in greater depth**

### **Who were the partners of I-CARE?**

**Linköping University, Sweden** | May Griffith (Coordinator), Bo Liedberg, Kajsa Uvdal, Per Fagerholm, Neil Lagali

**Hebrew University of Jerusalem, Israel** | Gershon Golomb  
**Centre for Physical Sciences and Technology, Lithuania** | Raunas Valiokas, Živilė Ruželė

**Vironova AB, Sweden** | Jenny Ahlqvist

**MLase AG, Germany** | Johannes Junger, Michael Baumann, Chris Lohmann and Karin Kobuch (Technical University of Munich)

### **What was the I-CARE Project about and what were its major achievements?**

Our aim was to develop a regenerative medicine-based treatment for corneal Herpes Simplex Keratitis (HSK), to replace highly ineffective donor cornea transplants currently used to treat vision loss. We designed an approach to simultaneously treat the disease and regenerate the damaged cornea, drawing heavily on nanobiotechnology

## Why did I-CARE work?

I-CARE worked because of the synergies of all the partners involved. We needed each other's expertise to achieve our goals. This was why we joined forces in our original application. Most partners had not worked together prior to I-CARE, but we very quickly developed trust and with that, a close working relationship that has continued beyond the duration of I-CARE. We would not have been able to achieve as much solely through national grants and national collaborations. The wider EU platform and expertise were essential.

We met approximately every six months to discuss our progress and plan the next steps. These meetings also gave us a chance to get to know one another better- PIs and trainees alike. Our most memorable meeting was in Munich during Oktoberfest.

In total, I-CARE had **10** articles, **2** submitted, **5** book chapters, **2** reviews, **1** article dedicated to the general public and **3** patents filed.



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