OPPORTUNITIES IN FP7 AND THE EUROPEAN TECHNOLOGY PLATFORM NANOMEDICINE

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The European Union has long supported nanosciences. After some initiatives mostly at the level of individual Member States, actions to promote this key technological approach were systematically taken in the 1990s. As a result Europe is in a leading position in nanotechnology. Now nanotechnology begins entering the commercialisation phase and the European society and industry expect to reap the benefits of the new knowledge through innovative products and processes. To meet the challenges and to ensure Europe's competitiveness in this sector there is the need to join forces across disciplines, sectors and national borders as well as to increase investment, boost interdisciplinarity, create the necessary infrastructures, expand human resources and develop international co-operation. At the same time, societal concerns brought about by the development of new applications should be duly addressed as well as potential regulatory issues. These priorities are central to the European integrated, safe and responsible approach to nanotechnology, as proposed by the European Commission in two Communications, the European Strategy and the Action Plan 2005-09[*].

Nanotechnology research has received constant and growing support in Europe. A total of almost 1.4 billion Euro has been committed under the 6th EU Framework Programme for Research and Technological Development (FP6) to more than 550 projects. Significant increases are further expected over the duration of the 7th Framework Programme that lasts until 2013[**]; almost 600 million Euro have been already allocated in 2007 after the first FP7 calls for proposals.

Nanotechnology often benefits of an interdisciplinary approach, which become of paramount importance in nanobiotechnology or in *converging* science and technology. In particular, the understanding of the human body in such an unprecedented level of detail opens up the possibility of targeting and fighting diseases with extreme accuracy not only in the acute or chronic phases but even at the pre-symptomatic stage. Nanomedicine, the application of nanotechnology to health, offers the potential of novel and often ground-breaking solutions across the whole medical sector, at present targeting widespread and complex illnesses such as cancer, cardiovascular diseases, multiple sclerosis, Alzheimer's and Parkinson's disease, diabetes or infections like HIV. The most advanced areas of nanomedicine today are already in use or undergoing clinical trials, including nanotechnology-based targeted drug delivery systems or an array of nanoparticle-enabled diagnostics. These novel tools hold the potential of detecting and/or eliminating the onset of disease at the level of single cells. In addition, the nanoscale design of molecules, products and devices offer inherently biocompatible and complete solutions for organ failure or severe injuries, with e.g. artificial skin, bone and cartilage already being in a stage of advanced development or partially on the market.

The challenge is for research but also for education and for the research infrastructures. The Commission is engaged via its actions and programmes such as Erasmus**** and Marie

Curie***, or the "Research Infrastructures" part of FP7***. Moreover, the management of IPR can be a particular challenge for interdisciplinary research and innovation.

An open, balanced and science-based dialogue within the society is also promoted. The collaboration of researchers in natural sciences and the societal scientists is fostered, also contributing to the creation of a shared base of knowledge concerning nanotechnology. The European Commission has been pilot in promoting a societal dialogue. It is precious if other countries throughout the world launch initiatives similar to those carried out in Europe, so to enrich the dialogue as a whole and our have possibility of benchmarking and identifying the best practices.

Ethical issues are also addressed, and in January 2007 the European Group on Ethics delivered its opinion on Nanomedicine. All European FP research projects are submitted to a due ethical review, if the case. The European Commission adopted a Code of Conduct for Responsible Nanotechnology Research in early 2008*.

As all new technological solutions, nanotechnology developments may involve possible risks and these need to be duly assessed. With regard to regulation, a high level of public health, safety, environmental and consumer protection is aimed at. This requires the identification of safety concerns, the collection of appropriate data for an adequate health and environmental impact assessment of the products data, and action at the earliest possible stage through adjustments, where necessary, of risk assessment procedures for issues of nanotechnology. Relevant research projects are funded and a compilation has been recently published*****. In the meantime, the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) has adopted opinions on this matter.

The European Commission is also looking into the legislative issues of the increasing use of nanotechnologies and a review of existing European legislation applicable to nanotechnology is realised.

* http://cordis.europa.eu/nanotechnology/ and http://cordis.europa.eu/nanotechnology/actionplan.htm
** http://cordis.europa.eu/fp7
*** http://cordis.europa.eu/nanotechnology/src/eu_funding.htm
**** http://ec.europa.eu/education/index_en.html and http://ec.europa.eu/education/programmes/mundus/index_en.html
***** ftp://ftp.cordis.europa.eu/pub/nanotechnology/docs/final-version.pdf

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