NANOBIOTECHNOLOGY AND NANOMEDICINE IN SPAIN

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Abstract

Spain presents a lag with the European Union in terms of R & D in both total investments relative to GDP and company involvement in the financing of such investment. Spanish companies' research shortfall suggests that they fail to develop know-how of their own and, moreover, they are failing to take advantage of the technology generated by public research centres. This makes it essential to increase the critical mass and research excellence of our Science and Technology System. To meet these challenges, the Spanish government started in 2005, the INGENIO 2010 program, to maintain and improve existing R & D and Innovation programs and to focus significant resources on new strategic initiatives.

The INGENIO 2010 programme aims to achieve a gradual focus of these resources on strategic actions to meet the challenges faced by the Spanish Science and Technology System. This gradual focus will be achieved by allocating a significant portion of the minimum annual increase of 25% in the national R & D and Innovation budget to strategic initiatives grouped in three major lines of action:

• The CENIT Program (National Strategic Technological Research Consortiums) to stimulate R & D and Innovation collaboration among companies, universities, public research bodies and centres, scientific and technological parks and technological centres. The CENIT program co-finance major public-private research activities. These projects will last a minimum of 4 years with a minimum annual budgets of 5 million euros, where i) a minimum of 50% will be funded by the private sector, and ii) at least 50% of the public financing will go to public research centres or technological centres.

• The CONSOLIDER Program to reach critical mass and research excellence. CONSOLIDER Projects offers long-term (5-6 years), large scale (1-2 million euros) financing for excellent research groups and networks. Research groups may present themselves in all areas of know-how of the National R & D and Innovation Program.

• The CIBER (virtual research institute) promote high quality research in Biomedicine and Health Sciences in the National Health Care System and the National R & D System, with the development and enhancement of Network Research Structures.

In addition to these three main programs, support actions to increase Human resources creating new stable research positions and a strategic scientific and technological infrastructures program to ensure the availability and renewal of scientific and technological equipment and the promotion of scientific and technological parks linked to Universities and public research bodies, are also included in the Ingenio 2010 initiative.

As an example of the Spanish nanobio and nanomedicine structures, three main structures exist in this moment devoted to improve the collaboration at national level and promote collaborations at international level.

The "nanobiomed" consolider consortium integrated by 60 researchers from 7 research institutes and universities. The main research activities are based on the use of nanoparticules for drug delivery, biosensors and enhanced MRI contrast.

The Spanish Technology Platform on NanoMedicine (STPNM) is a joint initiative between Spanish industries and research centres working on nanotechnologies for medical applications

The CIBER BBN is one of the new CIBER consortiums existing in the country that was created under the leadership of Instituto de Salud Carlos III (ISCIII) to encourage quality research and the critical mass of researchers in the field of Biomedicine and Healthcare Sciences. The scientific areas comprised within the CIBER-BBN are: Bioengineering and biomedical imaging, Biomaterials and tissue engineering and Nanomedicine, and the Center's research is focused on the development of prevention, diagnostic and follow-up systems and on technologies related to specific therapies such as Regenerative Medicine and Nanotherapies. The CIBER-BBN is formed by 49 research groups, 46 of which are full members and 3 of which are associates

In summary, the evolution of this new research structures confirms that the nanobiotechnology and nanomedicine is a research priority in Spain and that exists a potentially strong sector to be developed in the next years.