

**SESIONES CIENTIFICAS DEL CTB
VIERNES 10 DE ABRIL DE 2015**

Prof. M.-Pilar MARCO

Nanobiotechnology for Diagnostics Group (Nb4D, www.iqac.csic.es/nb4d)

IQAC-CSIC (www.csic.es)

CIBER-BBN (www.ciber-bbn.es)

With a degree in Pharmacy by the University of Barcelona (1985), M.-Pilar Marco started her scientific career with a Master Thesis on the *Synthesis of Analogues of the Alkaloid Ervitsine* (1986) performed at the Organic Chemistry Department of the Pharmacy school under the direction of Prof. Marius Rubiralta. Her PhD thesis entitled *Synthesis and Regulatory Aspects of the Insect Molting Hormone System* (1990), directed by Prof. Josep Coll at the Spanish Council for Scientific Research (CSIC) was granted with a fellowship of the Spanish Ministry of Science.

For three years (1990-1993) she worked as a postdoctoral researcher at the University of California in Davis in the group of Prof. Bruce D. Hammock on *Immunochemical Analytical Methods for Environmental and Biological Monitoring*.

On year 1996 she gained her position as Tenured Staff Scientist at the Spanish Council for Scientific Research (CSIC) where, as head of the *Applied Molecular Receptors* group (AMRg, nowadays *Nanobiotechnology for Diagnostics* group, Nb4D), her research has been focused on the production of selective bioreceptors, particularly specific antibodies for non-antigenic small organic molecules, and the development of bioanalytical techniques and biosensors. On year 2007 she got her position as Professor of Research of the CSIC. For about five years (2006-2011), she has been the Head of the *Chemical and Biomolecular Nanotechnology* Department of the Advanced Chemical Research Institute of Catalonia (IQAC) of the CSIC.

Nowadays she is the Coordinator of the *Nanomedicine Research Program* of the Networking Research Center for Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN). Her research interests are focused on the investigation of *new transducing principles to develop bioanalytical multiplexed platforms* for clinical diagnostics. She has been principal investigator of an important number of EC and Spanish projects, contracts with European and US companies. As result of her research she is co-author in more than 170 publications of international relevance and of several patents, some of them under exploitation. Moreover, she has been director of more than 14 PhD theses.

Nanobiotechnologic Perspectives for *In Vitro* Diagnostics

The so-called "omic" technologies have accelerated the number of candidate biomarkers discovered providing the perception that soon the health status of an individual will be defined by its molecular signature resulting from biomarker expression profiles. This fact calls for highly multiplexed devices able to measure simultaneously many biomarkers. On top of this challenge, there is the demand for a more personalized and efficient medicine, which requires rapid, reliable, flexible and competent diagnostic technologies. The new knowledge on the unique properties of nanostructured materials has opened up the possibility to investigate the influence that biorecognition phenomena produce on the new optical and/or electrical properties of these systems. Novel micro/nano fabrication technologies offer the possibility to create improved transduction schemes. Moreover, certain biomolecules such as the antibodies or the DNA have fascinating features such as the possibility to respond selectively to the presence of bioactive substances or to create multiplexed platforms based on synthetic oligonucleotide codified biomolecular probes. Nanostructured surfaces and nanoparticles of different materials can be the basis for the construction of novel functional biohybrid biomaterials which allow envisaging new exquisitely sensitive high performance biological sensors, giving rise to a new generation of enhanced diagnostic approaches able to give answers to the actual and future diagnostic challenges.