B·DEBATE International Center for Scientific Debate BARCELONA

IDIBAPS Institut D'Investigacions Biomèdiques August Pi i Sunyer

MYRIAM PANNETIER-LECOEUR CV

PARTICIPANT AT:

A DIALOGUE WITH THE CEREBRAL CORTEX:
CORTICAL FUNCTION AND INTERFACING

April, 29th-30th, 2015, Barcelona

Myriam Pannetier-Lecoeur, Senior Scientist at Service de l'Etat Condensé at **CEA Saclay**, Saclay, France

Myriam Pannetier-Lecoeur is Senior Scientist at Service de l'Etat Condensé at CEA Saclay since 2001. She has a long expertise in the area of magnetism, of magnetic sensor development and has been involved in several European and National projects for magnetic sensor development, in particular in the area of medical applications, such as Magneto-Encephalography, Magneto-cardiography or low field MRI. She has authored of more than 60 articles and is inventor of 14 patents on magnetic technologies. She has been awarded the James Zimmerman Prize of the International Federation for Medical and Biological Engineering Society (2014) and the Aymé Poirson Prize from the French Academy of Sciences (2008) for magnetic field sensors development for medical applications. She currently coordinates the Magnetrodes project (FP7-FET 2013-2016) on magnetic probes for neuronal activity recordings

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Magnetrodes for Brain Interfacing

Spin electronics offers nowadays the possibility to create very sensitive, micrometer-scale magnetic field detectors. 'Magnetrodes' is an FP7-FET project, started in January 2013, aiming to exploit this technological advance to create novel tools for probing neuronal magnetic fields at the cellular level. The first goal of the project is to develop the magnetic equivalent of an electrode, a 'magnetrode', sensitive enough to detect the very small magnetic fields induced by the ionic currents flowing within electrically active neurons, and small enough to probe a limited number of cells. We target also to adapt magnetrodes also for local nuclear magnetic resonance spectroscopy (MRS); thus, they could record both electromagnetic and chemical activity of neurons. The magnetrodes will be tested in vitro and in vivo at various spatial scales, from brain areas down to single neurons. In parallel, based on the measurements with magnetrodes, we will augment existing computational models and develop new ones to characterize the electromagnetic fields emitted by neurons and neuron assemblies. We will use these models to bridge from the activity of single neurons to macroscopic non-invasive measurements such as electroencephalography (EEG) and magnetoencephalography (MEG).