Project Description   **PhD Thesis**

Neural interfaces based on graphene microtransistors.

Description of group/project

The Biomedical Applications Group takes advantage of the technological capacities available at the Clean Room of the IMB-CNM to provide novel solutions to different biomedical applications. One of our research lines is based on the use of micro- and nanosystems for in vivo and in vitro studies focused in understanding the brain.

In our group we are investigating the use of graphene as the active material to interface neural tissues. This includes the study of the fundamentals of the material, its integration on the standard nano- & microfabrication processes, the characterization of the fabricated devices and its application on in-vivo and in-vitro environments. In particular, we have demonstrated that graphene-based gSGFETs (Solution Gated Field Effect Transistors) are a very promising tool for recording neuronal activity as it allows the recording of infra-slow signals, where the current technology based on metal electrodes present important limitations.

Tasks

The research activity of the candidate will be framed mainly as a part of the Graphene Flagship Project, which is focused on the development of graphene-based neural interface technologies for the cortex, retina, and peripheral nerves. This multidisciplinary project involves integration of thin film technologies, with special emphasis in the fabrication and electrical characterization of graphene-based transistors for neural recording. The successful candidate will be involved in activities related to the design, fabrication, and experimental validation of graphene-based microtranistors for brain activity recording. These activities will be developed in close collaboration with electrophysiologists, in order to apply the novel capabilities for recording infra-slow signals to understanding the brain and its pathologies.

Requirements:

- Education: Master in Materials Science, Nanotechnology, Engineering, Physics, or equivalent degrees.
- Knowledge and Experience: Experience in electronics, electrophysiology and data analysis.

How to apply:

Applications should be sent to **Dr. Anton Guimerà** (anton.guimera@csic.es) and should include:
- A cover letter
- A full CV including contact details