Institute of Microelectronics of Barcelona IMB-CNM CSIC

The **IMB-CNM** is the largest institute in Spain dedicated to the research and development of Micro and Nano Technologies and Microsystems and with unique capabilities in silicon technology. It belongs to CSIC since its foundation in 1985 and is distinguished as a María de Maeztu Unit of Excellence.

IMB-CNM aims to contribute to the advancement of knowledge and to the economic and social development of society, as well as to the training of researchers and engineers and to the advice to public and private entities.

The research activities of IMB-CNM are dedicated to Micro/Nano Integrated Systems: miniaturized electronic systems which include sensing and/or actuating capabilities in addition to electronic information processing, power management and external interfaces.

The IMB-CNM is located on the Autonomous University of Barcelona (UAB) Campus and contains the largest clean room facilities in Spain with full capability to process its own CMOS technologies and laboratories.

Project Type: TFG/TFM

Project Title: Development of Lab-on-CMOS RDTs

Research Group: Chemical Transducers Group (GTQ)

Project Description:

- High Sensitivity Digital Immunoassays based on micro/nano-beads and electrochemical sensor array readout could be the solution for the lack of sensitivity in current antigen-detection Rapid Diagnostic Tests and a key tool for the management of future pandemics.
- The main objective of the work will be to find the optimal procedures and conditions for this innovative micro/nano-beads immunoassay

Work Plan:

- The immunoassay will be based on capture antibodies immobilized on the surface of magnetic microbeads and detector antibodies co-immobilized with an enzymatic label on the surface of a nanoparticles.
- The work will focus on the optimization of the assay parameters and procedures (size of the particles, incubation times, agitation regime, washing/filtering techniques).
- The readout of the assay will be performed with an electrochemical sensor chip.

The work plan will involve:

1. Literature Review. Understanding of working principles. Analysis of existing RDT platforms and their limitations (2 weeks).
2. Preparation of the reagents (functionalization of beads) (4 weeks).
3. Study of optimal procedures and assay parameters (8 weeks).
4. Evaluation of the performance in terms of sensitivity, specificity, and reproducibility (4 weeks).
5. Final analysis and report writing (2 weeks).

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Candidate desired studies:

- ✓ MSc Nanoscience and Nanotechnology
- ✓ MSc Biomedical Engineering
- ✓ BSc Nanoscience and Nanotechnology
- ✓ BSc Biomedical Sciences

Application Process:

Before applying, please **check with your TFG/TFM program supervisor,** as he/she may already be coordinating with us to assign the project.

If there is no such coordination**, complete this form and send your CV and a motivation letter** to **Talent@imb-cnm.csic.es**, with the **subject: "TFG/TFM at IMB-CNM"**

Your CV will be forwarded to the Researcher leading the project who will contact you directly if interested.

Check our website for more information about the IMB-CNM and our research activities

https://www.imb-cnm.csic.es/en

Take the next step in your research career with us!

*By applying, you accept our data protection policy.

**IMB-CNM (CSIC) adheres to the European Charter and Code of Conduct for Researchers, ensuring full alignment with their principles and requirements, including equal opportunity, transparency, merit and ability, caring for an open, fair, and excellence-based hiring processes.

IMB-CNM holds the HR Excellence in Research award, which acknowledges CSIC's commitment to continuous improvement in HR strategies for researchers.

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