

## 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

**Project Title:** Silk-Based Nanostructured Systems for Smart Fertilizer Release

**Research Group:** Chemical Transducers Group (GTQ)

### Project Description:

- ❖ To develop and characterize a nanostructured silk-based membrane capable of controlling the release of fertilizers in agricultural environments, taking advantage of its biocompatibility, biodegradability, and ability to form nanoporous structures to optimize nutrient delivery, enhance efficiency, and reduce environmental impact.

### Work Plan:

- Prepare and process silk fibroin membranes, incorporating fertilizer compounds for controlled release studies.
- Characterize the nanostructure of the membranes using techniques such as Scanning Electron Microscopy (SEM), porosity....
- Perform biodegradability tests in soil or aqueous environments.
- Analyze nutrient release profiles, using techniques like UV-Vis spectroscopy or ISFET-based sensing for ion detection.
- Document results and data interpretation.

### Candidate desired studies:

- ✓ MSc in Nanoscience and Nanotechnology
- ✓ Double Bachelor's Degree in Physics and Chemistry
- ✓ BSc in Nanoscience and Nanotechnology
- ✓ MSc in Chemistry

### 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.

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If there is no such coordination, complete this [form](#) and send your CV and a motivation letter to [Talent@imb-cnm.csic.es](mailto: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.