

**PIF2024 - Theranostic nanomedicines based on hydrogels and magnetic nanoparticles with neural regenerative capabilities (PID2023-1501700B-I00)**

**TRAINING PROGRAM**

This fellowship aims to train a PhD student with a multidisciplinary expertise in **Nanotechnology and Biomedical Engineering**. In selecting the student, the merit-based policy will implement gender balance. This student, whose training will culminate with the defence of his/her PhD thesis, will be formed on: (1) Biomaterials (*i.e.*, nanoparticles and hydrogels); (2) Cell culture techniques and toxicity studies *in vitro*; (3) Animal studies including experimental procedures and behavioural tests; and (4) Histology including tissue responses to biomaterials in SCI models. Due to the experimental diversity of this project, the student background could be Biomedical Engineering, Materials Science, Biophysics, or Life Sciences. Complementary to this training, the PhD student will also acquire skills in material characterization including DLS, static and frequency dependent magnetization studies, SEM, TEM, and optical microscopy. The student will also be trained in **soft skills**, as team working and communication, statistics, data management, outreach activities, knowledge transfer, gender dimension, and open science practices.

The PhD candidate will complement his/her interdisciplinary training with the following **courses/activities**: A postgraduate course in Frontiers in Materials Science (ICMM-CSIC), IEEE Magnetic Society summer school on Magnetism, a course on Animal Experimental Training (HNP-SESCAM), a course on Microscopy and Image Analysis (HNP-SESCAM), summer courses on Nanotechnology and Biomedicine organized by the UIMP-CSIC, national/international conferences on Nanotechnology, Magnetism and Biomaterials (at least, 1 conference per year, *e.g.*, E-SFB, E-MRS, SBAN, ISCoS, EU-TERMIS, Int. Conf. Sci. Clin. Appl. Magnetic Carriers, ICMAT-Singapore). The student will do some **short research stages** at the laboratories of our collaborators in Europe, the USA and/or Japan.

Given the interdisciplinary of the project, the **available PhD Programs** for selection are diverse. However, we would preferentially encourage our PhD student to enroll in either the "Biochemistry, Molecular Biology and Biomedicine" Doctorate Program from the Universidad Complutense de Madrid (**UCM**) or the "Condensed Matter Physics, Nanoscience and Biophysics" or "Advanced Materials and Nanotechnology" Doctorate Programs from the Universidad Autónoma de Madrid (**UAM**), opened to his/her final decision. This last option, for instance, is particularly adequate as the program includes research on: (1) Nanostructured materials, (2) Biomaterials, functionalization of surfaces and biosensors and (3) Magnetic materials by the topic and methodologies of the project.

Mentorship and guidance: The student will be mentored in weekly team meetings to discuss the planned work and ongoing results and day-by-day (on-demand) individual meetings for in-depth discussions about the project progress and technical challenges encountered. Collaborative research: The student will engage in collaborative research derived from ongoing and future-funded European and other international projects of the MAMBIO group. Dissemination activities to the society: Participation in seminars/talks in schools, guided visits at the ICMM-CSIC and HNP-SESCAM, science fairs and other events (*e.g.*, Programa 10<sup>-9</sup>, MUNCYT, 11F, Pint of Science, Ciencia de Barrio, Ciudad Ciencia, Women in science).