**PhD OFFER - PRE2023**

**Institute of Materials Science of Barcelona (ICMAB-CSIC)**
**Nanomol-Bio Group**

# Nanoarchitectonics to create new molecular nanomaterials for biomedical applications (ARMONIA) - PID2022-137332OB-I00

**NANOMOL-BIO GROUP:**

The advertised doctoral position will be carried out at the Nanomol-Bio Group (ICMAB-CSIC). The group has wide expertise and recognized excellence in the synthesis, physico-chemical characterization, processing, and study of molecular materials for biomedical applications. We are actively involved in implementing nanotechnology and sustainable and economically efficient technologies for preparing advanced functional molecular materials with interest in nanomedicine (therapy and diagnosis).

As one of the main Spanish research groups specialized in nanomedicine, we are members of the Biomedical Research Networking Centre in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN) and responsible of Unit 6 (Biomaterial processing and nanostructuration) of NANBIOSIS ICTS.

**Institute of Materials Science of Barcelona (ICMAB-CSIC):**

The Institute of Materials Science of Barcelona (ICMAB-CSIC) is a multidisciplinary research center focused on cutting-edge research in functional advanced materials in the fields of ENERGY, ELECTRONICS, NANOMEDICINE, and application fields yet to imagine. The ICMAB is integrated within the Barcelona Nanocluster in Bellaterra (BNC-b), a research network that includes the UAB, the CSIC (ICMAB, IMB-CNM and ICN2) and IRTA, part of the UAB Research Park of the Universitat Autònoma de Barcelona (PRUAB) and the ALBA Synchrotron. The BNC-b aims to share advanced scientific equipment and promote and disseminate nanoscience and nanotechnology. The ICMAB offers a complete range of scientific services, and it participates in all kinds of educational and promotional activities. Many ICMAB researchers teach at the UAB Master's degree in Nanotechnology and Materials Science and also on the UAB degree on Nanoscience and Nanotechnology.

**DESCRIPTION OF THE PROJECT:**

The multidisciplinary project will use nanotechnology and advanced materials as key for the development of new products for health. In this frame, the candidate will use molecular materials and supramolecular chemistry, as a smart strategy to design and control nanostructures for the development of molecular based products, such as nanoparticles, nanovesicles and smart surfaces based of self-assembled monolayers,

showing non-conventional chemical, physical and biological properties for advanced therapies, early diagnosis, or disease prevention. High control on nanostructured materials fabrication, deep knowledge of their physico-chemical characteristics and the analysis of how these materials interact with the biological surrounding will be carried out to identify the critical quality attributes of the new biomaterials essential for activity and safety.

Specifically, the candidate will use the novel concept of Nanoarchitectonics to create advanced material platforms, in which self-assembly processes are used to arrange nanosize structural units in advanced materials creating reliable nanosystems. As material building blocks, we are going to use single molecules of different nature and nanosystems developed and well-studied by our group: highly stable unilamellar quatsome nanovesicles, radical dendrimers and self-assembly monolayers to biofunctionalized surfaces.

The activity and safety of all advanced materials platforms will be validated for specific medical indications by our biomedical and clinician collaborators.

**ACADEMIC BACKGROUND / SKILLS:**

Candidates must hold a degree in Chemistry, Materials Science, Biochemistry, Biomedicine, Biotechnology or Nanoscience and a recognized master's degree (or equivalent), both with high qualifications. An interdisciplinary outlook is desired and will be encouraged.

Experience in processing molecular materials at the nanoscale, nanoparticle characterization techniques, organic synthesis, spectroscopic characterization, nanoscience, and cell cultures will be highly valued.

We are looking for a collaborative and proactive person, as well as a team player with the ability to work effectively on complex research projects in a multidisciplinary environment with good knowledge of English.

**APPLICATION:**

Candidates should send a motivation letter, CV, to admin_nanomol@icmab.es by November 30th. After CV evaluation, shortlisted candidates will be interviewed.

**RELATED LINKS TO THE POSITION**

https://icmab.es/

https://www.icmab.es/mnom/nanomol-bio

http://www.ciber-bbn.es/

http://www.nanbiosis.es/

https://conexion-nanomed.csic.es