

JOB OFFER: PhD contract (PIF2024-PID2023149734NB-C21)

Overall description of the Project: We offer a **4-year contract** to develop a doctoral thesis working in the framework of the Coordinated project **DYNAPRINT-Dynamic nanocomposite (bio) hydrogels in 3D/4D printing (DYNAPRINT)**. The project's overall goal is to develop novel polymer hydrogels through a comprehensive investigation of dynamic physical (crystalline) and covalent crosslinks as a strategy for designing 3D/4D printable hydrogels. To that end, the Project is split into three main parts: i) the investigation of polymer crystallization both in the bulk state and in solution, ii) the investigation of polymer gelation mechanisms and driving forces (physical, chemical, and dynamic bonds), and iii) to master gels additive manufacturing.

Role of PhD in the Project: The PhD student will be responsible for the following research activities:

- Chemical modification of water-soluble polymers with semicrystalline moieties
- Study of the structure and hydrogel assembly mechanisms for semicrystalline hydrogels and their combination with polymer nanoparticles using a combination of different experimental techniques (such as calorimetry, rheological techniques, and microscopy, among others)
- Manufacture of stimuli-responsive hydrogels through 3D/4D printing techniques as precursors of bio applications
- Present the thesis results in specialized conferences and publish them in high-impact factor journals.

The PhD thesis will be co-supervised by Dr. Rebeca Hernández (ICTP-CSIC, Madrid) from the Nanostructured Polymers and Gels group and Prof. Alejandro J. Müller (POLYMAT and University of the Basque Country UPV/EHU, Donostia-San Sebastián) from the Advanced Multiphasic Polymers (AMP) group. The experimental work will be carried out jointly in both laboratories. The selected researcher will conduct part of the experimental work at the NANOPOLYGELS group laboratory at ICTP-CSIC and the other part at the AMP group laboratory at POLYMAT, UPV/EHU. The candidate is expected to spend 2 years in Madrid and 2 years in San Sebastián.

Applicant Requirements:

- BSc and an official MSc (at least 300 ECTS credits in total) in Chemistry, Materials Science/Engineering, Biomedical Engineering, or a related field with a strong background in Polymer Science and Technology.
- Previous research experience in the field of polymers will be valued.
- A good command of spoken and written English is essential.
- The selected candidate is expected to be willing to undertake research stays abroad.

How to apply: Interested candidates must send their applications to rhernandez@ictp.csic.es and alejandrojesus.muller@ehu.es **before 15-10-2024** indicating in the e-mail subject PIF2024-DYNAPRINT, including in a single PDF file:

- A cover letter highlighting your interest in the position
- Curriculum vitae
- The names and contact addresses (email) of two academic referees.
- Certificate of BSc and MSc marks

Expected date for incorporation (to CSIC): 1 January 2025

Contact and information:

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[http://www.polymat.eu/en/groups/Advanced%20Multiphasic%20Polymers%20\(AMP\)%20Group](http://www.polymat.eu/en/groups/Advanced%20Multiphasic%20Polymers%20(AMP)%20Group)