

CONTRATOS PREDOCTORALES 2022 SEVERO OCHOA

PROJECT TITLE / JOB POSITION TITLE:

Novel multifunctional natural-polymer and nanoparticles hybrids for tissue regeneration

JOB POSITION RESEARCH LINE:

RL5.- BIOACTIVE MATERIALS FOR THERAPY AND DIAGNOSIS

RESEARCH PROJECT / RESEARCH GROUP DESCRIPTION:

Research project:

Tissue engineering and regeneration medicine (TERM) are fast-evolving medical fields demanding the development of novel materials for our aging society. Therefore, natural polymers and nanocomposites with improved surfaces, response activities and tuned properties which improve the performance and the functional versatility are pushing the current state of the art.

The objective of the Ph.D project is to design natural hydrogels and NPs systems displaying a variety of shapes, topographies and porosities encompassing features such as biocompatibility, biointegrability in different parts of the body (internally or externally), stimuli responsiveness or programmed biodegradation profiles while being mechanically compliant. The Ph.D. candidate will explore the synthesis of bacterial cellulose-natural polymer hybrids. In particular, protein-based polymers such as silk, and collagen and polysaccharides such as cellulose, hyaluronic acid and chitosan. A set of inorganic functional NPs will be added to the hybrid composites in order to provide additional functionalities such as magnetic, plasmonic, bactericide, etc. Student will learn a broad range of techniques from physics, chemistry and biology.

Related publications of this topic:

1. Roig-Sanchez S., Fernández-Sánchez C., Laromaine A., and Roig A. *Bio and soft-imprinting lithography on bacterial cellulose films* Materials Today Chemistry, 21, 100535, (2021). DOI: 10.1016/j.mtchem.2021.100535Mat.
2. Anton-Sales I., Roig-Sanchez, S., Sánchez-Guisado, M. J., Laromaine, A., and Roig, A. *Bacterial nanocellulose and titania hybrids: cytocompatible and cryopreservable cell carriers*. ACS Biomaterials Science and Engineering, 6 (9), 4893 - 4902, (2020). DOI: 10.1021/acsbiomaterials.0c00492
3. Roig-Sanchez S., Jungstedt E., Anton-Sales I., Malaspina D.C., Faraudo J., Berglund L.A., Laromaine A., and Roig A. *Nanocellulose films with multiple functional nanoparticles in confined spatial distribution* Nanoscale Horizons, 4 (3), pp. 634 - 641, (2019). DOI: 10.1039/c8nh00310f.

JOB POSITION DESCRIPTION:

Candidate Profile:

Enthusiastic PhD candidate graduated in chemistry, nanoscience, materials science, physics, biochemistry or biotechnology holding a MSc on similar fields are encouraged to apply.

Requirements:

- Highly motivated toward experimental research in a chemistry lab
- Good team worker player and with initiative to solve pressing needs in TERM.
- Good communication skills
- Fluent in English

Position description:

The candidate will join the Nanoparticles and Nanocomposites Group as a team member of the recently awarded grant from the Spanish Ministry of University of Science and Innovation entitled: BIOBASED SOFT FUNCTIONAL NANOCOMPOSITES FOR TISSUE REGENERATION (BIOSOFT-REGE) PID2021-122645OB-I00.

The candidate will join an interdisciplinary and multicultural team, please visit the Nanoparticles and Nanocomposites Group web (nn.icmab.es) and twitter (@NNgroupICMAB) to know more about us.

The PhD work will be co-supervised by Prof. Dr. Anna Laromaine / Pablo Guardia
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GROUP LEADER:

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