

Job Title: PhD position: Nanostructured stable organic radicals for sensing applications Chiral photocatalytic nanozymes for efficient ROS-mediated cancer therapy (CHIRALZYMES)

CHIRALZYMES, funded by La Caixa Foundation, Junior Leader Fellowship 2023-Incoming programme (Ref: LCF/BQ/PI23/11970030) and headed by Dr. Paula Mayorga-Burrezo, will provide a high-quality research training in Material Science for biomedical applications to the doctorate candidate. Moreover, a soft skills training will be conducted, including problem solving, task prioritization, time management, intellectual property, data management or dissemination among others.

The trainee researcher will become a member of the Nanostructured Molecular Materials for Biomedicine research group (NANOMOL-bio) at the Barcelona Materials Science Institute (ICMAB–CSIC) (ICMAB-CSIC). NANOMOL-Bio group (<https://nanomol-bio.icmab.es/>) is devoted to the synthesis, physicochemical characterization and development, up to pre-clinical regulatory phases, of molecular and polymeric (nano)materials for biomedical applications: (i) therapy, (ii) diagnosis, (iii) prevention, and (iv) regenerative medicine. Together with e-MolMat group constitutes the NANOMOL Research Unit, which is member of the Biomedical Research Network (CIBER) in the area of Bioengineering, Biomaterials and Nanomedicine (<https://www.ciber-bbn.es/>); and is awarded with the TECNIO label (<https://tecnio.org/>) given to Catalan research units with high innovative and tech transfer capacities. Both groups have been recognized as Consolidated Research Groups (GRC) by the Generalitat de Catalunya through the SGR recognition. ICMAB (<https://icmab.es/>), on the other hand, is one of the world's leading institutes in Materials Science research. Its main strategic objectives and missions is to make an impact in the field of new materials for applications in energy, electronics and health and so it provides facilities, state-of-the-art equipment and most importantly, excellent scientists and professionals, to assure a rewarding environment.

Finally, the candidate will also join the Materials Science PhD programme from the Universitat Autònoma de Barcelona (UAB), one of AQU Catalunya recognized excellent quality courses place on the Campus of International Excellence of the UAB. This detailed training plan summarizes the involvement of all these actors during the training period of the young researcher.

Job description: The candidate will be in charge of the **design and synthesis of photocatalytic nanoparticles with enzymatic-like activity and surface-anchored chiral molecules. to be exploited as Reactive Oxygen Species (ROS) generators for cancer treatments.** The main goal is the challenging and yet undisclosed simultaneous conceptual combination of organic nanozymes, chirality and photocatalytic activity, as a game-changing approach towards high therapeutic efficacy.

Main Tasks:

The main tasks that will be carried out within the project include:

- Synthesis and characterization of photocatalytic nanozymes.
- Chiral surfaces modification of the photocatalytic nanozymes.
- Structural characterization.
- Evaluation of the ROS production.
- *In vitro* experiments:

Requirements:

- Applicants should hold (or expect to obtain by 15.09.2024) a MSc. degree in Chemistry, Materials Science, or related disciplines.
- The ideal candidate should have a background in Material Science and physicochemical characterization techniques.
- We seek outstanding candidates with initiative and team-working abilities.
- Publications record will be considered.
- Good written and spoken English skills are mandatory

Conditions:

- Full time contract (37.5 h/week).
- Gross monthly salary of 1705.10 €
- Duration of 3 years (starting as soon as possible and before 15.12.2024)

How to apply

Submit the following application documents to pmayorga@icmab.es:

- Resume or CV including a list of publications
- Motivation Letter
- Statement of the applicant's research experience
- List of three references with contact details