



## FPI PhD fellowship of 4-year contract

### The role

The doctoral thesis topic will be about “**Development of green and sustainable antimicrobial materials based on biodegradable cationic amphiphiles**”. The PhD student will generate a platform of natural product-derived cationic amphiphiles and will investigate their application as antimicrobial agents by employing two strategies: one aimed at preventing biofilm formation through the development of antimicrobial polymeric materials and the other at eradicating surface biofilms through the development of effective antimicrobial delivery systems (nanoparticles and adjuvants). He/she will evaluate the physicochemical properties as well as the antimicrobial and antibiofilm activity of these new materials against bacteria and fungi. Additionally, the PhD student will assess the cytotoxicity and environmental impact of these new surfactants and materials.

### What do we look for?

- **Qualifications**

A master degree is mandatory

- **Professional experience**

Previous experience in synthesis, microbiology or cell culture would be an asset.

- **Competences**

We are looking for a highly motivated candidate with an interest in research for innovation. Good oral and written communication skills in English are expected.

### Working conditions

- **Contract duration:** 4-year contract
- Estimated annual gross salary: according to the Spanish Government call “Ayudas para contratos predoctorales para la formación de doctores 2023”
- Target start date: November 2023

## The group

### **Biocompatible Surfactants and Ionic Liquids (BSILs). Department of Nanobiotechnology (IQAC-CSIC).**

Chemistry is currently facing one of the greatest challenges in its history. Environmental concerns and regulatory pressure have provided the driving force to try to replace petrochemical-based compounds with those based on naturally occurring renewable sources. Addressing this challenge involves investigating for how renewable resources can be used in the synthesis of new biocompatible compounds.

Since it is well known that surface-active compounds can adversely affect the aquatic environment, there is a clear trend to move towards non-toxic biodegradable renewable raw materials as building blocks for the synthesis of non-polluting biocompatible surface-active compounds. Our group is conducting extensive research on novel surfactants and ionic liquids derived from natural renewable sources like amino acids and natural oils. The goal is to develop biocompatible compounds with low toxicity and high biodegradability. Surfactants and ionic liquids with these properties would meet the requirements of food, cosmetic and pharmaceutical industries.

<https://www.iqac.csic.es/research/departments/surfactants-and-nanobiotechnology/>

## The institute

The **Institute for Advanced Chemistry of Catalonia (IQAC)** is one of the research centers of the Spanish National Research Council (CSIC). The Institute is located in Barcelona and it was created in 2007 with the mission to perform research of excellence in Chemical Sciences with the broad goal of improving the quality of life. The general strategy to achieve this mission involves the application of chemical approaches to address and solve societal challenges, mainly those related to human health, the sustainability of chemical processes and products, and the needs for novel materials for different applications. Since its establishment, IQAC has been in a permanent attitude to transfer its knowledge and technology results to the industrial sector.

The research developed at IQAC is organized around two main nodes: **Biological Chemistry** and **Nanobiotechnology** and it is facilitated by a number of Key Enabling Technologies. Considering the objectives pursued, many of the investigations carried out by the Research Groups at IQAC lie at the intersection between nodes.

In addition, our Institute holds a set of scientific and technical facilities run by highly qualified scientists and technical personnel with a solid background and long lasting expertise. These facilities are available not only to IQAC research groups, but also to potential users from both academia and private institutions. In any case, the technical services from IQAC are always wide open to attend any inquiry and to offer their best efforts to find adequate responses to specific needs.

## How to apply?

Those interested may email their **CV** and **motivation letter** to **M<sup>a</sup> Teresa García** [teresa.garcia@iqac.csic.es](mailto:teresa.garcia@iqac.csic.es) or **Lourdes Pérez** ([lourdes.perez@iqac.csic.es](mailto:lourdes.perez@iqac.csic.es)) adding **FPI PhD fellowship** to the email subject.

**Deadline: 30 September 2023**