

OPEN POSITION at the Institute for Advanced Chemistry of Catalonia IQAC-CSIC

PhD (FPI) Candidate on

Dynamic complex chemical systems: applications in organocatalysis and biomolecular recognition (DynaChemSys)

We are currently looking for a highly motivated **Doctoral Candidate** to embark on a path towards their PhDs in the frame of **DynaChemSys** National Research Program (PID2021-128411NB-I00) at the **Institute for Advanced Chemistry of Catalonia** (IQAC) (contact: Dr. Ignacio Alfonso and Dr. Jordi Solà), one of the research centres of the Spanish National Research Council (CSIC).

The PhD project: The study of dynamic complex chemical systems able to respond to external stimuli and change their composition accordingly is a recent appealing topic in scientific research. This Systems Chemistry perspective can be utilized to create functional molecular species, as well as to identify improved receptors or catalysts. In this proposal, we will deepen knowledge in this specific research field, from a fundamental point of view. Thus, our general objective will be to develop new complex dynamic chemical systems (such as Dynamic Combinatorial Libraries, DCL) by combining building blocks able to establish dynamic connections (like dynamic covalent bonds) to study their behavior under different experimental conditions, leading to a better understanding of the factors affecting their stability and physicochemical properties. With that, we expect to broaden the scope of the dynamic covalent/combinatorial chemistry approach to different open questions in chemical research, like the molecular recognition of bio-relevant species or the identification of improved organocatalysts.

The PhD research will focus on:

- (i) Interdisciplinary project on supramolecular chemistry
- (ii) State of the art organic synthesis and structural characterization
- (iii) Binding studies with a broad range of experimental techniques (NMR, UV-Vis, fluorescence, SPR, etc.)
- (iv) Catalysts characterization, kinetic studies
- (v) Biological applications of the newly developed molecular systems

Qualifications and Competences

- ✓ An outstanding M.Sc. degree in Chemistry, Biological chemistry, Biotechnology, or related field,
- ✓ Eligible as PhD student at University of Barcelona (Spain),
- ✓ Research experience in organic synthesis, analytical methods (HPLC, etc.), organic compounds purification and structural characterization (multinuclear NMR, MS, IR, UV-Vis, fluorescence),
- ✓ Ability to work in an international team,
- ✓ Inter- and multidisciplinary thinking,
- ✓ High motivation,
- ✓ An integrative and cooperative personality with excellent communication and social skills,
- ✓ Fluent in English – written and oral.

Eligibility Criteria: Candidates should hold a **degree** in a relevant area of Chemistry, Biotechnology, Biochemistry, or related disciplines and should have completed a **MSc degree** at a time of incorporation.

Working conditions: Fully-funded PhD positions (4 years)

The group: The position we offer will be embedded in the Institute for Advanced Chemistry of Catalonia (IQAC) within the Department of Chemical Biology in the Supramolecular Chemistry group (<https://www.iqac.csic.es/research/departments/biological-chemistry/supramolecular-chemistry/>). The research of our group is focused on using supramolecular approaches to solve chemistry challenges, with a strong focus on selective catalysis and biomedical problems (diagnostic and therapeutic solutions to diseases).

The institute

IQAC-CSIC carries out research of excellence in chemical sciences to address and solve problems of socio-economic relevance, mainly those related to human health, the sustainability of chemical processes and products, and the needs for novel materials for different applications. The research developed at IQAC is organized around two main nodes: Biological chemistry and surfactants and nanotechnology. The biological chemistry node carries out fundamental and applied chemical research involving the development of cutting-edge chemical methods, including molecular recognition of bio-relevant molecules.

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 in the offer, send updated CV including academic qualifications and a motivation letter to: Ignacio Alfonso (ignacio.alfonso@iqac.csic.es) and/or Jordi Solà (jordi.sola@iqac.csic.es) before 23/01/2023.

Online application deadline: **26 January 2023**.

<https://www.aei.gob.es/convocatorias/buscador-convocatorias/ayudas-contratos-predoctorales-formacion-doctores-2022>

The announcement (convocatoria): <https://www.aei.gob.es/convocatorias/buscador-convocatorias/ayudas-contratos-predoctorales-formacion-doctores-2022-0>