

ESR 1 position

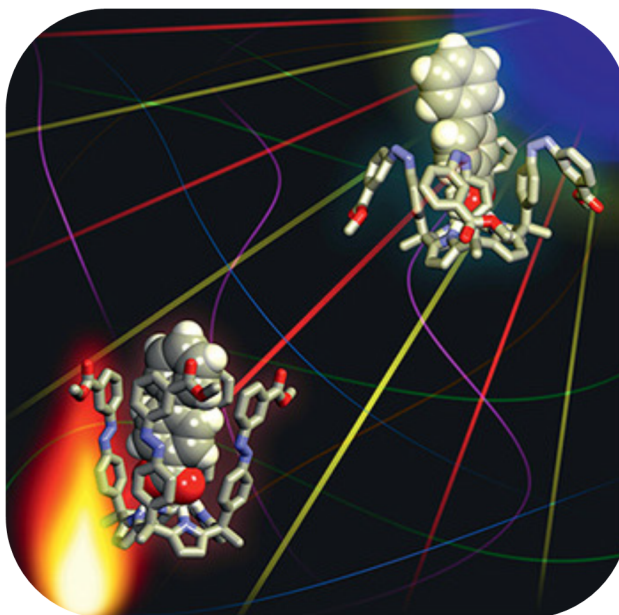
Project title: Hydrogen-bonded molecular capsules based on calix[4]pyrrole scaffolds

Location: ICIQ, Spain

Supervisor: Prof. Pablo Ballester

Objectives of the individual project:

- 1) Acquisition of expertise in synthetic and characterization procedures of water soluble calix[4]pyrrole and calix[4]pyrrole with azo and hemithioindigo moieties in their walls.
- 2) Evaluate and study the self-assembly and encapsulation processes of electron-active or photo-active guests by different techniques (i.e. NMR, UV-Vis, Fluorescence, electrochemistry, ITC...).
- 3) Gain experience in electrochemical and photophysical processes for the characterization of his/her already prepared molecular capsules (during secondment at ISOF-CNR).
- 4) Discover the power of computational methods in supramolecular chemistry.



- 5) Find out the importance of the industrial sector in research development (Industrial Secondment).

Expected Results:

The ESR is expected to end her/his recruitment with a library of different calix[4]pyrrole based structures able to form capsular assemblies in water or in organic solvents. In addition, she/he will demonstrate the responsive ability of some of the molecular capsules to an external stimulus (i.e. light incidence). Moreover, a complete characterization of the assemblies is expected: solid-state structures, thermodynamic, kinetic and photophysical characterization in solution, and gas-phase characterization.

Planned secondment(s):

Academic Secondment: During his/her 3 months of secondment at ISOF-CNR ESR1 will be immersed into the world of electrochemistry and photophysical chemistry and end up with a full characterization of his/her system prepared during the first year and with a wide knowledge of the time-resolved spectroscopic techniques.

Industrial Secondment: Six-months secondment at Covestro facilities in ChemPark Leverkusen in order to gain experience in industrial applications of capsules in coating materials (stability studies of the capsules in polyurethane matrices, determination of the new coating properties such as transparency, scratch resistance, adhesion tests, curing...).

Eligibility requirements



EU eligibility criteria for candidates: Candidates of any nationality, but in order to be eligible for the positions the following criteria applies to all applicants:

- The applicant shall at the time of recruitment be in the **first four years of his/her research career** and have **not been awarded a doctoral degree**.
- The applicant must not have resided or carried out his/her main activity **in Spain for more than 12 months in the 3 years immediately prior to the recruitment**.

Candidates profile: candidates must hold a **Master's degree in Chemistry** with excellent academic transcripts. We are looking for **highly motivated** students with **good communication skills**

All candidates must **prove full proficiency in spoken and written English** (B2 certificate, TOEFL, or equivalent).

Questions regarding the recruitment can be sent to: noah@noah-itn.eu.

Questions regarding the project can be sent to: pballester@iciq.es or garagay@iciq.es

