

## ESR Position in ITN ArtMoMa: Artificial Molecular Machines

The Institute for Organic Synthesis and Photoreactivity (ISOF) of the National Research Council of Italy (CNR), is offering an Early Stage Researcher (ESR) position on:

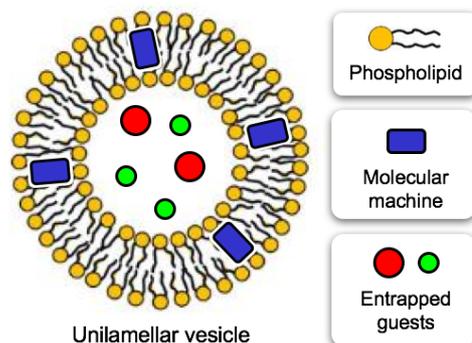
Topic: **Integration of molecular and supramolecular machines with lipid bilayers**

Reference: **ArtMoMa-ESR10**

<https://euraxess.ec.europa.eu/jobs/561081>

The project is funded by the Marie Skłodowska Curie Innovative Training Network “ArtMoMa”, within the Horizon 2020 Programme of the European Commission. The project aims to structure a training network for doctoral students in the field of Artificial Molecular Machines for a period of 48 months. ArtMoMa is a consortium of 20 partners composed of high profile universities, research institutions and companies located in 8 European countries, and will train 15 Early Stage Researchers. It is coordinated by Prof. Nicolas Giuseppone of the CNRS-University of Strasbourg, France. More information about the ArtMoMa consortium and activities can be found in the project website: <http://artmoma-h2020.eu>

**PROJECT DESCRIPTION:** The goal of the ESR is the incorporation of (supra)molecular machines in lipid bilayers as tools to compartmentalise solution environments. The bilayers will be self-assembled in water with control of morphology, size and properties from commercially available lipids. Then, the introduction in the membranes of functional mechanically interlocked molecules and related system will be investigated. Liposomes with diameters of hundreds of nm will be assembled and doped with switchable (supra)molecular species, developed within the consortium, either in the bilayer or in the inner aqueous phase. The two main objectives of ESR10 will be: (i) to understand the effect of the compartmentalised environment on the operation mechanism of the molecular machines; and (ii) to investigate if and how the functioning of the embedded molecular machines, induced by external stimulation, can alter the properties of the membrane (e.g., stability, morphology, permeability towards entrapped guests). The doped liposomes will be characterised by DLS, TEM, and spectroscopic techniques (NMR, UV-vis, CD), including steady-state and time-resolved absorption luminescence measurements. As lipid bilayers are realistic models of cell membranes, systems showing interesting effects will be transferred to biomedical investigations. The operation of light-driven molecular pumps in membranes could lead to the photogeneration of concentration gradients between physically separated compartments. Systems of this kind would open up new routes for the conversion of solar energy into chemical energy.



Refs: *Langmuir* **2014**, *30*, 13667; *Nat. Nanotechnol.* **2015**, *10*, 70; *Angew. Chem. Int. Ed.* **2019**, *58*, 4108.

**PhD SUPERVISOR:** **Alberto Credi**, CNR Associate Research Director and Professor of Chemistry at the University of Bologna. For enquiries about the position, please write to: [alberto.credi@isof.cnr.it](mailto:alberto.credi@isof.cnr.it).

**LOCATION:** The position will be based in **Bologna, Italy**, at the Center for Light Activated Nanostructures (CLAN), a joint laboratory set up by CNR and the University of Bologna: <https://centri.unibo.it/clan/en>



**ELIGIBILITY CRITERIA:** In order to be eligible, each applicant must fulfil the following criteria:

**Nationality:** Candidates may be of any nationality.

**Mobility:** At the date of recruitment, the applicant must not have resided or carried out his/her main activity (work, studies etc.) in Italy for more than 12 months in the last 3 years immediately prior to his/her recruitment. Compulsory national service and/or short stays such as holidays are not taken into account.

**Qualifications and research experiences:** the applicant must fulfil the requirements defined for Early Stage Researchers (ESRs): ESRs are researchers who **at the date of recruitment have NOT yet been awarded the doctoral degree and are in the first 4 years (full time equivalent) of his/her research career.** The position is suitable either for students who wish to undertake a first doctoral degree (PhD in Chemistry at the University of Bologna) or as a first salaried research position for researchers currently studying for a PhD that will be awarded after recruitment. Full-time research experience is measured from the date when a researcher obtained the degree which formally entitled him or her to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the researcher is recruited or seconded, irrespective of whether or not a doctorate is or was ever envisaged.

**KEY RESPONSIBILITIES:** The position is available for 36 months and the key tasks are:

- To manage and carry out through research projects
- To attend and participate in research and training activities within the ArtMoMa network and local courses
- To write articles for scientific peer reviews
- To write a PhD thesis, if enrolled in the doctoral school of the University of Bologna
- To teach and disseminate research in the scientific community (international conferences) and non-scientific community, by outreach and public engagement
- To be involved in departmental and group activities

**FORMAL REQUIREMENTS:** Applicants should hold MSc degree (or equivalent) with good grades. Applications from more experienced researchers who are close to obtaining a PhD in a relevant subject are also encouraged. Good English skills are required. As criteria for the assessment of the applicants' qualifications, emphasis will also be laid on relevant work experience and previous publications (if any).

**BACKGROUND OF SUCCESSFUL CANDIDATE:** We are looking for an outstanding highly motivated candidate with a strong academic record holding a Master degree in Chemistry. An excellent theoretical background, experience in self-assembly / bilayer membranes and vesicles / spectroscopic methods / physical organic chemistry / photochemistry and good laboratory skills are prerequisite for this ambitious project. Candidates will be integrated in an international multi-disciplinary team. The candidate must therefore have excellent personal skills and be able to work in a team. The position will be located in Bologna, Italy, including secondments to partner groups. Women are especially encouraged to apply.

**TERMS OF EMPLOYMENT:** The successful candidate will receive an attractive salary in accordance with the MSCA regulations for early stage researchers. The generous financial package includes a living allowance, a mobility allowance and a family allowance (if eligible). The approximate starting date of the contract is **1<sup>st</sup> February 2021**. The candidate, if undertaking a first doctoral degree, will be enrolled in the PhD program in Chemistry at the University of Bologna. The guaranteed PhD funding is for 36 months.

A career development plan will be prepared for each fellow in accordance with his/her supervisor and will include training, planned secondments and outreach activities in partner institutions of the network. The ESR fellows enrolled as doctoral students at the University of Bologna are supposed to complete their PhD thesis by the end of the 3<sup>rd</sup> year of their employment.

For more information, please visit the [Marie Skłodowska-Curie Actions Innovative Training Networks](#) website.