

Fully-funded PhD position in redox bioinspired supramolecular catalysis

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Context and aim of the project

The design of supramolecular systems and machines aimed at performing chemical tasks, including catalysis, is a topic of strong interest. Among current challenges, the combination and control of two properties at the molecular level opens the way towards switchable multifunctional and multi-state systems. The aim of this project is to develop redox-active molecular systems with catalytic activity that can be controlled and operated through external stimuli. The design of such systems will involve the introduction of stimuli-responsive motifs in redox architectures such as tweezers. The interaction with an external stimulus will trigger and /or allow control over redox changes occurring in the system, thus exerting direct influence on its reactivity. This project is expected to provide advanced redox catalytic systems that can operate under selective conditions.

Job description

We seek a motivated and dedicated PhD researcher for this project that spans the fields of redox systems, homogeneous and redox catalysis, and ligand design. The student will perform the multi-step synthesis of tweezers incorporating redox-active sub-units and evaluate their properties in redox catalysis using standard techniques and spectroscopies such as NMR, IR, MS, XRD and UV-vis.

About the project

This project is an ANR-funded position within a collaborative project with a team in Sorbonne Universités (IPCM, SU, Dr Guillaume Vives) specialized in supramolecular tweezers.

Relevant related publications

- A. Das, C. Hessin, Y. Ren, M. Desage-El Murr *Chem. Soc. Rev.* **2020**, *49*, 8840.
 L. Benda, B. Doistau, C. Rossi-Gendron, L.-M. Chamoreau, B. Hasenknopf, G. Vives *Commun. Chem.* **2019**, *2*, 144.
 B. Doistau, L. Benda, J.-L. Cantin, L.-M. Chamoreau, E. Ruiz, V. Marvaud, B. Hasenknopf, G. Vives *J. Am. Chem. Soc.* **2017**, *139*, 9213.
 J. Jacquet, P. Chaumont, G. Gontard, M. Orio, H. Vezin, S. Blanchard, M. Desage-El Murr, L. Fensterbank *Angew. Chem. Int. Ed.* **2016**, *55*, 10712.
 J. Jacquet, S. Blanchard, E. Derat, M. Desage-El Murr, L. Fensterbank *Chem. Sci.* **2016**, *7*, 2030.

Candidate profile and how to apply

The applicant should hold a masters degree in molecular chemistry with experience in organic and organometallic synthesis and/or homogeneous catalysis. The candidate should demonstrate the ability to work in cooperative environments as well as autonomously, have excellent communication skills and good command of english. Email applications are encouraged and should include the following documents: CV, cover letter and the names of three referees **as single pdf file**, and master's grades, sent by e-mail to **both** contacts: Dr Aurélie Guenet aguenet@unistra.fr and Prof. Marine Desage-El Murr desageelmurr@unistra.fr

