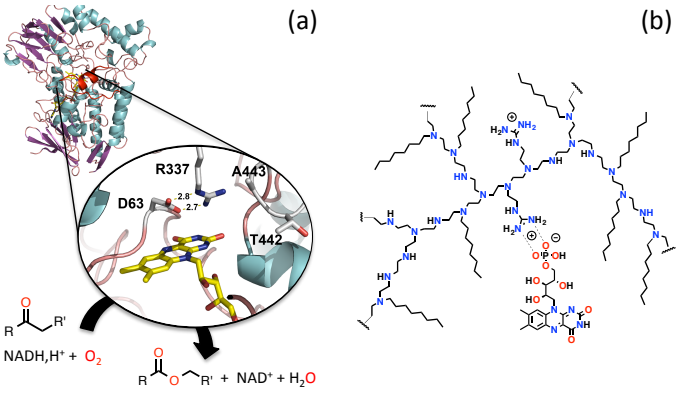
Open position for Post-Doc (12 months) in Orsay (south Paris, France)
in Artificial Enzymatic Catalysis for Organic Synthesis

Keyword: Biomimetic Catalysis, Artificial Enzyme, Dioxygen activation, Green Chemistry, Asymmetric Synthesis.

In the present context of sustainable growth, the chemical industry is facing the daunting challenge to rethink most of its well-proven synthetic processes, in order to develop environmentally friendly new ones. Yet, nature has figured out an elegant manner to perform organic synthesis under mild condition in water by using sophisticated catalysts known as enzymes. Unfortunately, the use of enzymes for chemical process (bio-conversion) is quite limited because of various practical problems involved in gene cloning, protein expression and protein stability. The development of bio-inspired catalysts, mimicking enzymes activities, is therefore a major challenge in order to take advantage of both enzyme specificities and robustness of handmade catalysts. This project aims at investigating an artificial enzyme system in the context of organic synthesis in aqueous medium. Nature, which uses catalytic processes for modifying organic substrates, is an inexhaustible source of inspiration for the development of a sustainable chemistry. By mimicking flavoenzymes by a macromolecule/cofactor entity, we were able to reproduce the original activity of flavoreductases (*Nature Commun.* **2015**, 8509). We are now evolving this system towards the development of artificial monooxygenase and we recently reported the first artificial Baeyer-Villiger Monooxygenase enzyme (*Angew. Chem. Int. Ed.* **2018**, 57, 16412).



(a) Example of natural BVMO and (b) bio-inspired catalyst used in this project.

The new associate researcher will be in charge of: developing chiral polymers and/or chiral flavin cofactors for asymmetric catalysis, recycling NADH in solution by associating this artificial enzyme with a natural one, studying new potential catalytic activities with the system and investigating the mechanism involved in catalysis.

Candidate Profile: the candidate should have a PhD in bioorganic/bioinorganic catalysis, asymmetric synthesis, or organic chemistry with particular interest in green chemistry. Most importantly, the candidate should be highly motivated with a strong interest for bio-inspired chemistry, multidisciplinary and collaborative projects.

Contact: Dr. Frédéric Avenier (frederic.avenier@u-psud.fr) Institut de Chimie Moléculaire et des Matériaux d'Orsay, Laboratoire de Chimie Bioorganique et Bioinorganique, UMR 8182, Université Paris-Sud, Bât 420, 91405 Orsay Cedex, France. https://www.icmmo.u-psud.fr/en/teams/lcbb/.

The project is in collaboration with **Prof. Jean-Philippe Goddard**, IUF Junior (jean-philippe.goddard@uha.fr) Laboratoire d'Innovation Moléculaire et Applications UMR CNRS 7042-LIMA | IRJBD *Equipe Chimie Radicalaire, Hétérocycles et Interfaces*. Univ. de Haute-Alsace | Univ. de Strasbourg 3bis rue Alfred Werner 68093 Mulhouse, lima.unistra.fr