

Master 2 Internship in Synthetic Organic Chemistry

Synthesis of chiral heterocycles via gold-catalyzed cycloisomerization reactions and domino processes

Laboratory: Institut de Chimie de Nice, UMR7272

Institute: Université Nice Sophia Antipolis, Parc Valrose 06108 Nice cedex 2, France

Team: Equipe APSM

Contact: Pr. Véronique Michelet

Position: 6 months

Application deadline: 30/09/2017

Starting date for the training in the lab: January 2018

Catalysis represents one of the key points of sustainable chemistry and is among the 12 principles of "Green Chemistry" introduced by Paul Anastas and John Warner. Over the last years, gold catalysis has gained considerable significance in organic synthesis, since it comprises atom-economic and highly efficient processes for the transformation of relatively simple substrates into valuable, highly complex molecular architectures.¹ Despite these outstanding advances, the enantioselective variants have not flourished as fast and remain a highly challenging task.² Control of the absolute stereochemistry of a transformation is one of the most studied aspects of homogeneous catalysis. Today, about 80 % of the pharmaceutical molecules produced are chiral and this percentage is expected to increase due to strengthened drug safety regulations. Enantiopure intermediates represent an estimated fraction of 15% of the market for the chemical industry.

The ongoing ANR program GOLDWAR intends to address some technological barriers and contribute to fundamental research in the field of asymmetric cycloisomerization and domino reactions implying gold(I) and gold(III) catalytic systems.

The master student program will therefore combine organometallic and molecular chemistry, based on our experience in these fields.³ The fundamental study of cycloisomerization reactions and domino processes under homogeneous conditions in the presence of gold catalysts will be performed. These methodologies will open new routes to biologically active molecules.

Profile: The candidate should have strong skills in organic synthesis and synthetic methodology. An interest for catalysis and sustainable development will be appreciated.

Application: Please send your cover letter and CV to veronique-michelet@enscp.fr

References:

¹ Book: *Gold Catalysis: An Homogeneous Approach* (Eds. Toste, F.D.; Michelet, V.), Imp. College Press, **2014**.

² Reviews: Pradal, A.; Toullec, P.Y.; Michelet, V. *Synthesis* **2011**, 1501. Wang, Y.-M.; Lackner, A. D.; Toste, F.D. *Acc. Chem. Res.* **2014**, *47*, 889.

³ Mariaule, G.; Newsome, G.; Toullec, P.Y.; Belmont, P.; Michelet, V. *Org. Lett.* **2014**, *16*, 4570. Tomás-Mendivil, E.; Starck, J.; Ortuno, J.-C.; Michelet, V. *Org. Lett.* **2015**, *17*, 6126 and *ACS Catal.* **2017**, *7*, 380.