

## Research Topic for the ParisTech/CSC PhD Program

**\*Field:** Chemistry, Physical Chemistry and Chemical Engineering

**Subfield:** Chemistry

**Title:** Asymmetric Catalysis toward BioRelevant Architecturally Novel Natural and Unnatural Products

**ParisTech School:** Chimie ParisTech

**Advisor Name:** Virginie VIDAL

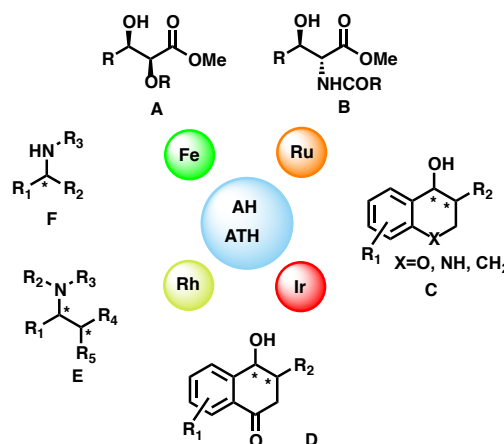
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**(Lab, website):** Institut de Recherche de Chimie Paris (IRCP), CSB2D Team

<https://www.chimie-paristech.fr/>

### Short description of possible research topics for a PhD:

Our group develops new catalytic processes for the synthesis of natural products and targets of biological interest. We have been interested in the development of novel methods for synthetic efficiency and atom and step economical processes using transition metal-catalyzed reactions as they provide a direct and selective way toward the synthesis of highly valuable products. The research program will be dedicated to the development of asymmetric catalytic methods in a context of sustainable development for carbon-carbon and carbon-hydrogen bond forming reactions using asymmetric hydrogenation (AH) or asymmetric hydrogen transfer reactions (ATH) <sup>[1]</sup> through dynamic kinetic resolution (DKR) <sup>[2,4,5]</sup> to target scaffolds of biorelevant molecules of medicinal interest such as mirabalin. <sup>[3]</sup> The PhD research program aims at developing new catalytic asymmetric approaches to address long-standing problems in the synthesis of chiral key intermediates such as A-F to access natural products and pharmaceutical drugs.



**Required background of the student:** Synthetic Organic Chemistry - Catalysis

**A list of 5(max.) representative publications of the group:** (Related to the research topic)

<sup>[1]</sup> Ayad, T.; Phansavath, P.; Ratovelomanana-Vidal, V. *Chem. Rec.* **2016**, *16*, 2750.

<sup>[2]</sup> Review : Echeverria, P.-G.; Ayad, T.; Phansavath, P.; Ratovelomanana-Vidal, V. *Synthesis* **2016**, *48*, 2523.

<sup>[3]</sup> Echeverria, P.-G.; Prévost, S.; Cornil, J.; Féraud, C.; Reymond, S.; Guérinot, A.; Cossy, J.; Ratovelomanana-Vidal, V.; Phansavath, P. *Org. Lett.* **2014**, *16*, 2390.

<sup>[4]</sup> Zheng, L.-S.; Féraud, C.; Phansavath, P.; Ratovelomanana-Vidal, V. *Chem. Commun.* **2018**, *54*, 283.

<sup>[5]</sup> Zheng, L.-S.; Féraud, C.; Phansavath, P.; Ratovelomanana-Vidal, V. *Org. Lett.* **2018**, *20*, 5107.