

Research Summary

Dr. Joanna Wencel-Delord has performed her PhD in France, Rennes and her research focused on designing new, easily accessible chiral ligands for Cu-catalyzed conjugate additions and Pd-catalyzed asymmetric allylic alkylation. During her post-doc fellowship conducted in the group of Prof. F. Glorius (Münster University, Germany), she has been working in the field of C-H activation. She has developed new methodologies for RhCp*-catalyzed dehydrogenative arylation reactions of aromatic and vinylic substrates as well as direct halogenations. Since her independent career as CNRS Research Associate her main research axis deals with development of asymmetric C-H activation reactions. Following this objective, a new and very general methodology for the synthesis of axially chiral compounds via sulfoxide-directed atroposelective C-H activation has been established. Besides, both diastereoselective and enantioselective strategies for stereoselective C(sp³)-H activation have been achieved, including design of original, sulfoxide-based chiral ligands.

The second research axis concerns development of new methodologies for the synthesis of C-N axially chiral compounds via direct N-arylation reactions. Such unprecedented asymmetric C-N couplings may be achieved by using hypervalent iodine reagents as extremely reactive coupling partners.

Finally, metal-free C-H functionalization of heterocycles is studied. We have thus discovered two unprecedented methodologies for metal- and photosensitizer-free, visible light mediated C-H perfluoroalkylation and acylation of heterocycles.