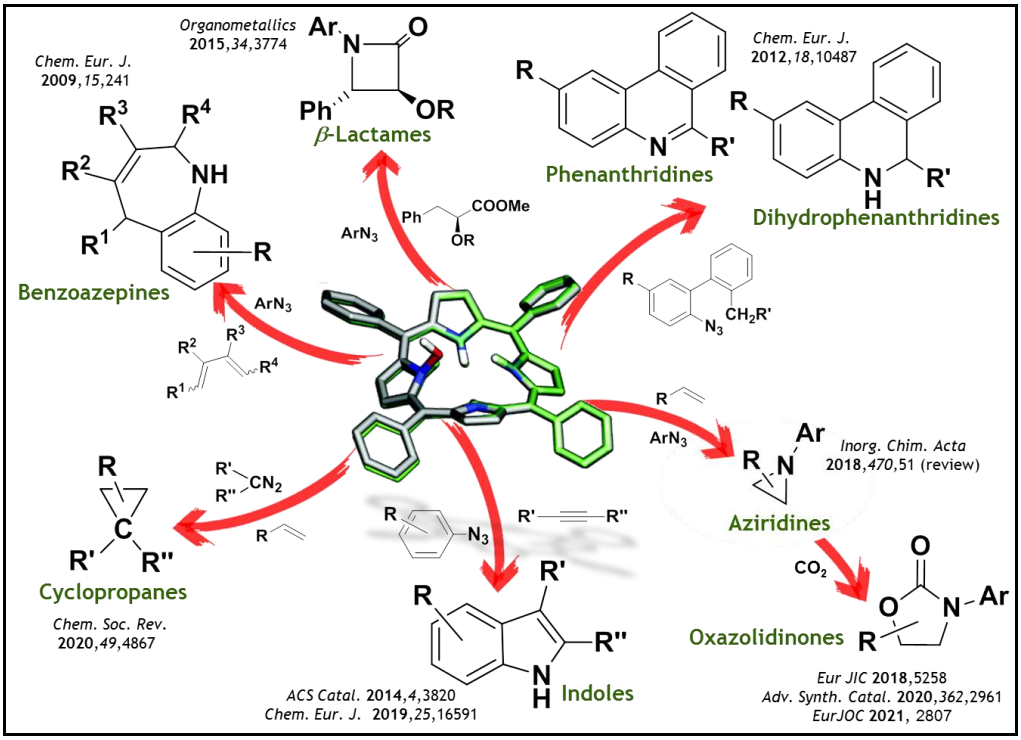
Metal Porphyrin Complexes: Smart Catalysts to Promote Eco-Friendly C-C and C-N Bond Formations

Chemistry Department of Milan University, Via C. Golgi 19, 20133 Milan, (Italy). emma.gallo@unimi.it

The chemical industry needs synthesizing fine chemicals by applying catalytic procedures that show selectivity, activity and stability, resulting in high TOF (turnover frequency) and TON (turnover number) values. An ideal catalytic system does not produce large amounts of side-products, avoids the use of toxic reagents, shows a high atom economy and the catalyst must be easily recovered and recycled. Based on these concepts, the employment of porphyrin-based catalytic processes is constantly growing due to the enormous potential of this class of molecules, whose chemo-physical properties can easily be fine-tuned by structural modifications of their organic skeleton and metal coordination sphere. We have studied in depth the employment of metal porphyrin complexes to create new C-N and C-C bonds by using atom-efficient procedures.[1] Several synthetic protocols which will also be discussed from a mechanistic point of view based on experimental and theoretical studies.



References

[1] Review: a) Damiano, C.; Sonzini, P.; Caselli, A.; Gallo, E. *Adv. Organom. Chem.* **2021**, *76*, *145*. b) Damiano, C.; Sonzini, P.; Gallo, E. *Chem. Soc. Rev.* **2020**, *49*, 4867