

Studies in Homogeneous Gold Catalysis - Method Development & Ligand Design -

Fabien Gagosz

^aDepartment of Chemistry and Biomolecular Sciences, the University of Ottawa, K1N 6N5, Ottawa Canada

E-Mail : fgagosz@uottawa.ca

Homogeneous gold catalysis is a field of research that has attracted much attention over the last two decades. While its potential has been underestimated for years, it has rapidly evolved into a useful synthetic tool allowing the efficient creation of molecular complexity and structural diversity, with applications in various domains including heterocyclic chemistry, natural product synthesis and material sciences.¹ For the most part, this success is intimately linked to the possibility of activating carbon- π systems with electrophilic gold complexes and generating a variety of cationic intermediates whose reactivity can be finely controlled and exploited.

This presentation will highlight some efforts from our group to access reactive gold species and use them in the development of synthetic methods based on cyclization and C-H bond functionalization events.² Studies on the development of new ligands allowing selectivity control by confining the catalytic site and Au(I)/Au(III) redox processes will also be discussed.³

¹ Selected reviews: a) Patil, N. T. and coll. *Chem Rev.* **2021**, *121*, 8478. b) Sekine, K.; Tanaka, K., Hashmi, A. S. K. and coll. *Chem Rev.* **2021**, *121*, 9113. c) Dan, A. K.; Sahu, R.; Parida, S.; Das, D. *Chem. Asian J.* **2022**, *17*, e202200896. d) Praveen, C. *Chem. Rec.* **2021**, *21*, 1697. e) Echavarren, A. M. and coll. *Chem. Rev.* **2015**, *115*, 9028.

² a) *Angew. Chem. Int. Ed.* **2018**, *57*, 13603; b) *Org. Lett.* **2022**, *24*, 7200; c) *Angew. Chem. Int. Ed.* **2022**, *61*, e202212893.

³ a) *Angew. Chem. Int. Ed.* **2022**, *61*, e202203452; b) *J. Am. Chem. Soc.* **2024**, *146*, 3660.