Metal- or metal-free? Complementarity towards the sustainable synthesis via C-H functionalization.

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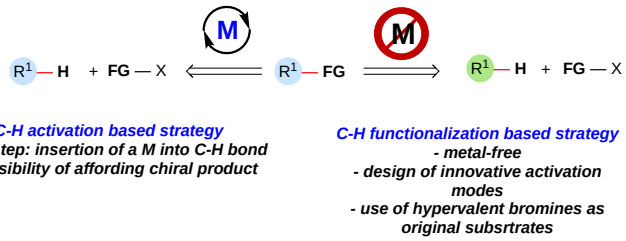
Sustainable, rapid, and efficient synthesis of complex organic molecules is one of the key challenges of modern synthetic chemistry. Aiming for this goal, the design of original transformations converting simple substrates into the desired, more complex products via C-H bond functionalization has been attracting the expanding attention of the scientific community.[1] Accordingly, a diversity of transformations, requiring either metal-based catalysts or alternative activation modes have been proposed. Herein, we would like to discuss our contribution to this field. We have developed various asymmetric C-H activation reactions to access rapidly atropisomeric molecules in high yields, using either atropodiastereoselective[2] or enantioselective protocols.[3] In parallel, we have also discovered that rare, hypervalent bromine reagents provide an alternative, metal-free solution to expand the molecular complexity via direct functionalization of a C-H bond, followed by C-C, C-O or C-N bond formation event. [4]



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