Diastereoselective Radical Cyclization Cascade of Ynamides Enabling Access to New Trifluoromethylated Tricyclic Structures

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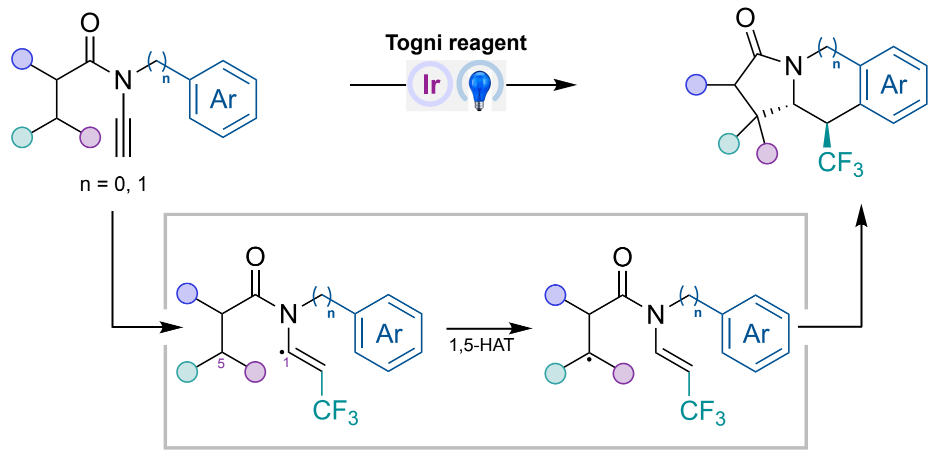
Despite significant advancements in radical cyclization cascades, [1] they are still attractive seeing how challenging and time consuming access to polycyclic scaffolds can be. Recently, our group reported a cyclization cascade employing terminal ynamides to access trifluoromethylated isoindolinones under photoredox conditions.[2] In light of our continued interest in the radical cyclization of ynamides, we have been motivated to further investigate their participation in more elaborate cyclization cascades. As shown in the scheme below, A novel multistep radical cyclization cascade of Ynamides has been developed, triggered by the addition of a trifluoromethyl radical under photocatalyzed conditions. the use of acetyl ynamides bearing an alkyl chain with an abstractable hydrogen in position 1,5 gives the product of 1,5 HAT, which after two cyclization steps leads to the formation of the tricyclic scaffolds in a diastereoselective manner.



In addition to providing a new utilization of ynamides in radical cyclization cascade, this reaction would afford an easy one step access to pyrroloindolinones from simple molecules. We report herein on the development of this reaction as well as its scope and limitations.

[1] C. Mahe, K. Cariou, Small Methods, **2021**, 5, 2000673.
[2] M. Cassé, C. Nisole, H. Dossmann, Y. Gimbert, J. M. Fourquez, L. Haberkorn, C. Ollivier, L. Fensterbank. *Sci. China Chem.* **2019**, *62,* 1542–1546.