

Catalytic approaches toward quaternary stereocenters

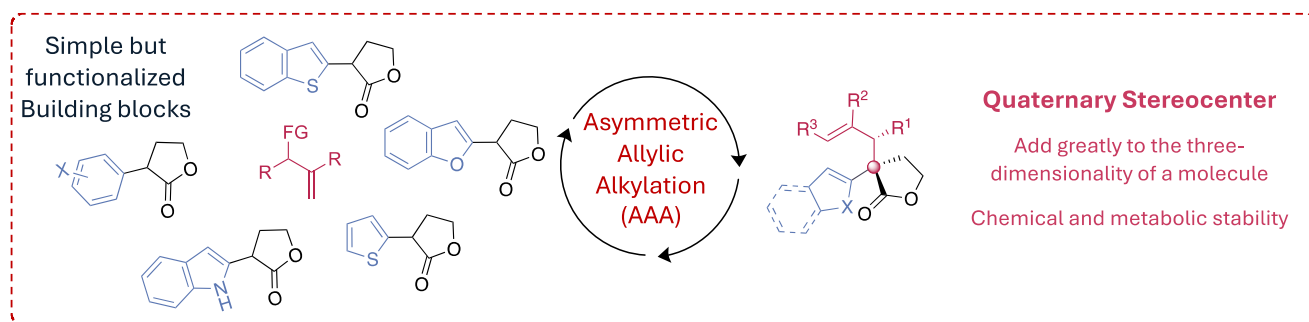
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Quaternary stereocenters which bear four carbon substituents at four vertices of a tetrahedron add greatly to the tridimensionality of small organic molecules. This key structural feature is undisputably recognized as preeminent in the search of selective biologically active compounds.¹ Noteworthy, the construction of quaternary stereocenters is extremely challenging as it is well illustrated by the exclusive natural origin of drugs bearing quaternary stereocenters.² Asymmetric Allylic Alkylation is a class of reactions which have been used successfully to build quaternary stereocenters.³ However, it has been applied to a restricted class of reaction partners entailing a moderate structural diversity.

We will disclose our recent approach based on Lewis Base catalysis allowing the access of chiral lactones bearing a single quaternary stereocenter or two adjacent quaternary tertiary stereocenters.⁴ A first illustration of the method versatility and its ability to generate chemical and scaffold diversity will be discussed.



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REFERENCES

1. Talele, T. T., *J. Med. Chem.* **2020**, 63, 13291-13315.
2. (a) Quasdorf, K. W.; Overman, L. E., *Nature* **2014**, 516, 181-191. (b) Liu, Y.; Han, S.-J.; Liu, W.-B.; Stoltz, B., *Acc. Chem. Res.* **2015**, 48, 740-751.
3. (a) Hong, A. Y.; Stoltz, B. M., *Eur. J. Org. Chem.* **2013**, 2745-2759. (b) James, J.; Jackson, M.; Guiry, P. J., *Adv. Synth. Catal.* **2019**, 361, 3016-3049.
4. (a) Mando, M.; Grellepois, F.; Riguet, E., *Chem. Commun.* **2020**, 56, 6640-6643. (b) Mando, M.; Fares, M.; Kowandy, C.; Grellepois, F.; Riguet, E., *Org. Lett.* **2022**, 24, 5351-5355. (c) Mando, M.; Grellepois, F.; Blanc, A.; Hénon, E.; Riguet, E., *Chem. Eur. J.* **2024**, 30, e202304138.