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Application of small-ring azaheterocyclic building blocks for the synthesis of pharmaceutically relevant nitrogen compounds

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Small-ring azaheterocyclic systems have acquired a pivotal position as building blocks in medicinal chemistry. In particular, aziridines, azetidines and beta-lactams have been shown to be eligible synthons for the construction of a broad variety of stereodefined heterocyclic frameworks, often endowed with pronounced biological activities. In this presentation, the synthetic flexibility of these three- and four-membered systems toward the preparation of different types of pharmaceutically relevant nitrogen-containing target structures will be explained. In that respect, a number of novel synthetic strategies toward a broad set of important heterocyclic scaffolds will be discussed (see figure below). In particular, different new methods for the regio- and stereoselective rearrangement of aziridines, azetidines and beta-lactams into functionalized four- to seven-membered hetero (bi)cycles will be disclosed. All these compounds represent relevant moieties encountered as substructures in a variety of biologically active natural products and pharmaceuticals.

Biography

Matthias D'Hooghe received a PhD degree in 2006 from Ghent University (Belgium) for his thesis entitled "2-(Bromomethyl)aziridines as versatile building blocks in organic chemistry". In 2007, he became Post-doctoral Assistant at Ghent University, and in 2009 he performed a Post-doctoral stay at Eindhoven University of Technology (The Netherlands). In 2010, he was promoted to Research Professor at Ghent University, and was granted tenure in 2015. His main research interests include the chemistry of small-ring azaheterocycles and the synthesis of bioactive heterocyclic compounds. He received several awards and is the author of 117 publications in international peer-reviewed journals.

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