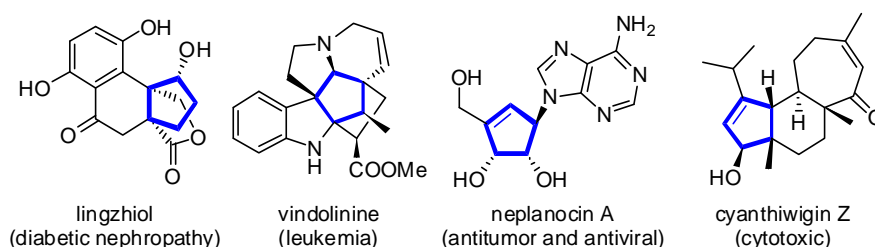


# NOVEL BUILDING BLOCK TOWARDS HIGHLY FUNCTIONALIZED CYCLOPENTANOID SCAFFOLDS

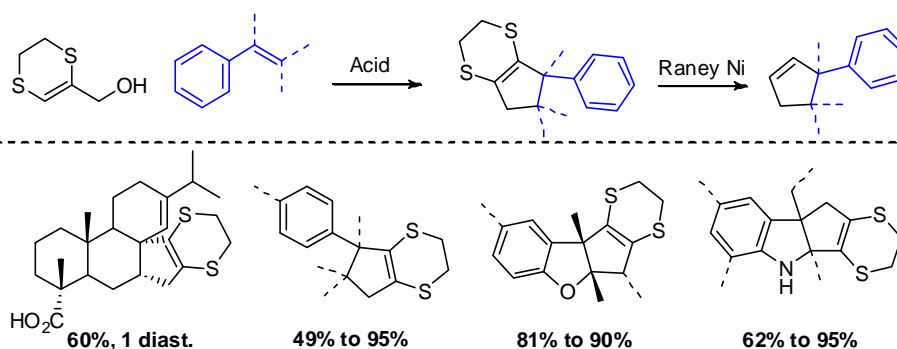
Bram Ryckaert, Jan Hullaert, Johan M. Winne

Department of Organic and Macromolecular Chemistry  
Ghent University, Krijgslaan 281, 9000, Gent, Belgium  
bram.ryckaert@ugent.be

There is a constant call for simplification in the way molecules are synthesized. This demand becomes problematic looking at some biological interesting compounds which often have a complex carbon skeleton, more  $sp^3$  character, and a high number of chirality. Privileged scaffold of biological active compounds are excellent anchor points for drug discovery, establishing the need for synthetic methods that rapidly assemble  $sp^3$ -rich carbocyclic scaffolds.



Our lab developed a (4+3) and (3+2) cycloaddition capable of synthesizing complex carbocyclic structures. Multiple success were obtained using furfuryl alcohols [1], [2] and in 2016 using a dihydro-dithiin alcohol [3]. As such aiding in the simplification process of natural product synthesis.



Further research focuses on expanding the scope of this cationic (3+2) cycloaddition to explore rapid routes to common natural product frameworks. An advantage of using the dihydro-dithiin, is the ease in which the cycloadduct can be diversified towards highly functionalized cyclopentanoid compounds.

[1] D. R. Laplace, B. Verbraeken, K. Van Hecke, and J. M. Winne, "Total synthesis of (+/-)-frondosin B and (+/-)-5-epi-liphagal by using a concise (4+3) cycloaddition approach," *Chem. - A Eur. J.*, vol. 20, no. 1, pp. 253–262, 2014.

[2] J. Hullaert, B. Denoo, M. Christiaens, B. Callebaut, and J. M. Winne, "Heterocycles as Moderators of Allyl Cation Cycloaddition Reactivity," *Synlett*, 2017.

[3] J. Hullaert and J. M. Winne, "(5,6-Dihydro-1,4-dithiin-2-yl)methanol as a Versatile Allyl-Cation Equivalent in (3+2) Cycloaddition Reactions," *Angew. Chemie - Int. Ed.*, vol. 55, no. 42, pp. 13254–13258, 2016.