Terpene Biosynthesis as Inspiration for Supramolecular Catalysis

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Nature’s extraordinary elegance when performing chemical reactions has fascinated and inspired chemists for decades. Arguably, one of the most complex organic transformations performed in living organisms, is the tail-to-head terpene (THT) cyclization.[1,2] It allows the construction of the most diverse class of natural products, namely terpenes, *via* nature’s way of combinatorial chemical synthesis. Thousands of different natural products are formed from just a handful of simple, acyclic starting materials: geranyl pyrophosphate (monoterpenes), farnesyl-PP (sesquiterpenes) and geranylgeranyl-PP (diterpenes). Nature utilizes enzymes, termed cyclases or terpene synthases, to carry out this complex transformation. Building upon our initial results,[3,4,5] we explore possibilities to utilize supramolecular structures to mimic such complex transformations in the laboratory. The latest results in this direction will be presented.

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[3] Q. Zhang, K. Tiefenbacher *J. Am. Chem. Soc.* **2013**, *135*, 16213.

[4] Q. Zhang, K. Tiefenbacher *Nature Chem.* **2015**, *7*, 197.

[5] Q. Zhang, L. Catti, J. Pleiss, K. Tiefenbacher J. Am. Chem. Soc. **2017**, *139*, 11482