First Step Toward Natural Ladderane Lipids

Leonard R. MacGillivray (University of Iowa), PRF #47632-AC1

Ladderane lipids are an exciting new class of natural products with frameworks akin to macroscopic ladders. Molecular ladders are difficult to synthesize in solution owing to problems aligning reactants in proper geometries.

The MacGillivray group employs hydrogen-bond-mediated self-assembly to direct [2+2] photodimerizations in solids to form ladderanes. To access the natural products, we seek to install carboxylic acid groups on the cyclobutane products. Here, we use a hydrogen-bond-acceptor template to achieve reactivity of a diene in the solid state (Fig. 1). Having identified a class of templates, we are screening members of the family to achieve the formation of [3]- and [5]-ladderanes.

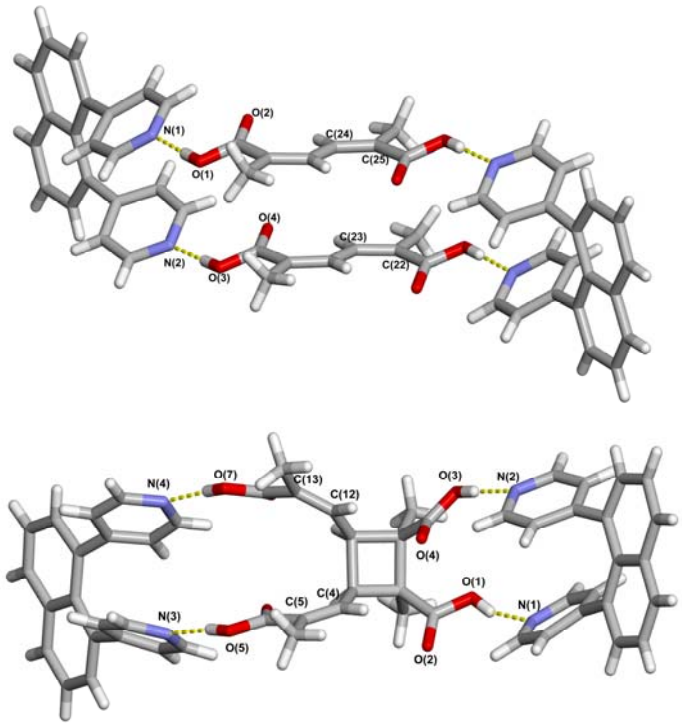

Fig. 1. *Template-directed reactivity of a diene in the solid state using a hydrogen-bond-acceptor template.*