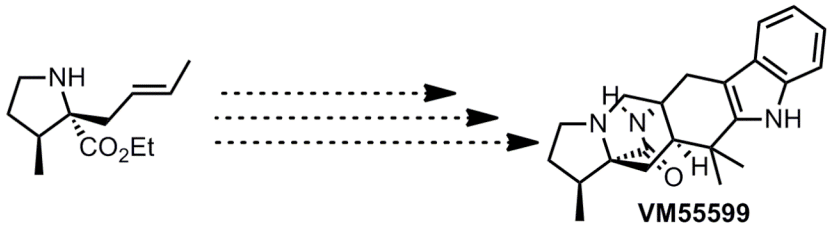
Application of a 2-aza-Cope 1,3-Dipolar Cycloaddition Cascade Toward The Total Synthesis of VM55599



Abstract: The natural product VM55599 is a structurally complex polycyclic indole alkaloid with a highly substituted pyrrolidine ring. Alkaloids within this family of natural products have been shown to display insecticidal, antihelmintic and antinematodal activity, and efficient synthetic routes to these alkaloids could prove useful in the development of new medicines. New synthetic methodologies that rapidly assemble highly functionalized pyrrolidine systems as precursors to such complex targets in a stereocontrolled fashion are highly desirable. Toward these goals, our lab has recently developed a novel one-pot, multicomponent protocol for assembling pyrrolidine rings via a high yielding, *endo*-selective, domino 2-aza-Cope-[3+2] dipolar cycloaddition. Further elaboration of the resultant pyrrolidine ring via a Pauson-Khand cycloaddition and subsequent ring expansion of model substrates are currently under investigation as a new approach toward VM55599.