Total Synthesis of (±)-Alstilobanine A

Significance: Monoterpene indole alkaloids usually consist of a tryptamine residue attached to a monoterpenoid unit. (±)-Alstilobanine A, however, features an intriguing rearranged skeleton. The authors based their concise synthesis on the conjugate addition of ester enolate to an in situ-generated nitrosoalkene and the formation of β-lactam via an intramolecular formal ketene–ketone [2+2] cycloaddition developed by Romo and co-workers (Org. Lett. 2006, 8, 4363).

Comment: The intermolecular conjugate addition of ester enolate onto nitrosoalkene, generated in situ from α-chlorooxime, proceeded efficiently to give H. This transformation highlights an interesting method to construct 1,4-dicarbonyl frameworks. Both C16-diastereomers could be used to access I, which then underwent a formal [2+2] cycloaddition to afford the desired syn-2-azadecaline in excellent yield and diastereoselectivity. The synthesis was completed in eight steps from L to generate the natural product in an impressive 14% overall yield.