Total Synthesis of (±)-Alstilobanine A

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

Comment: The intermolecular conjugate addition of ester enolate $F$ onto nitrosoalkene $G$, generated in situ from $\alpha$-chlorooxime $E$, 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 $L$ 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.