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Total Syntheses of (±)-β-Erythroidine and (±)-8-oxo-β-Erythroidine by an Intramolecular Diels–Alder Cycloaddition of a 2-Aminoacrolein

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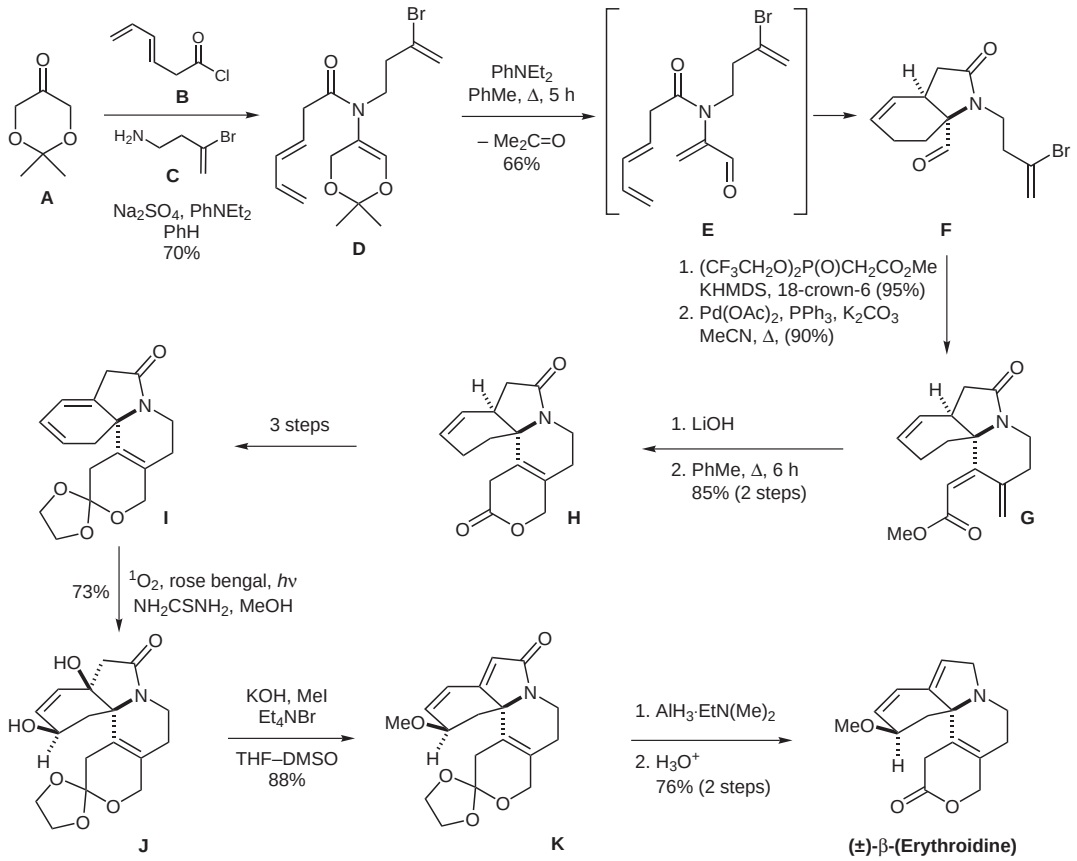
Synthesis of (±)-β-Erythroidine



Significance: A 13-step synthesis of the erythrinan alkaloid (±)-β-erythroidine is reported. A Diels–Alder cycloadditon, an intramolecular Heck cyclization and an electrocyclic ring closure are employed in the construction of the tetracyclic ring system.

Comment: Upon heating in refluxing toluene, amidoxin **D** underwent a retrocycloaddition and Diels–Alder cycloaddition to afford **F** in 66% yield. Ester **G** was saponified and the corresponding dienoic acid derivative heated in refluxing toluene to effect a 6π-electrocyclic ring closure. Introduction of the C3 oxygen was achieved diastereoselectively with singlet oxygen to give **J**, which was converted into β-erythroidine in three steps.

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