Concise Synthesis of the Alkaloid (±)-Aspergilline A

Significance: Aspergilline A was isolated from the fungus Aspergillus versicolor and possesses activity against the tobacco mosaic virus as well as anti-cancer activity. The Wood group reports a synthesis relying on an elegant pyrrolinone formation and a formal [3+2] cycloaddition.

Comment: Acylation followed by addition to an alkyne and double-bond isomerization transforms C into E. Mukaiyama aldol reaction creates the core structure in F. Imidate G undergoes formal cycloaddition with cyclopropenone to form I which is further transformed into the indole alkaloid aspergilline A through an oxidation–acetalization–decarboxylation sequence.