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Total Synthesis of (±)-Chartelline C

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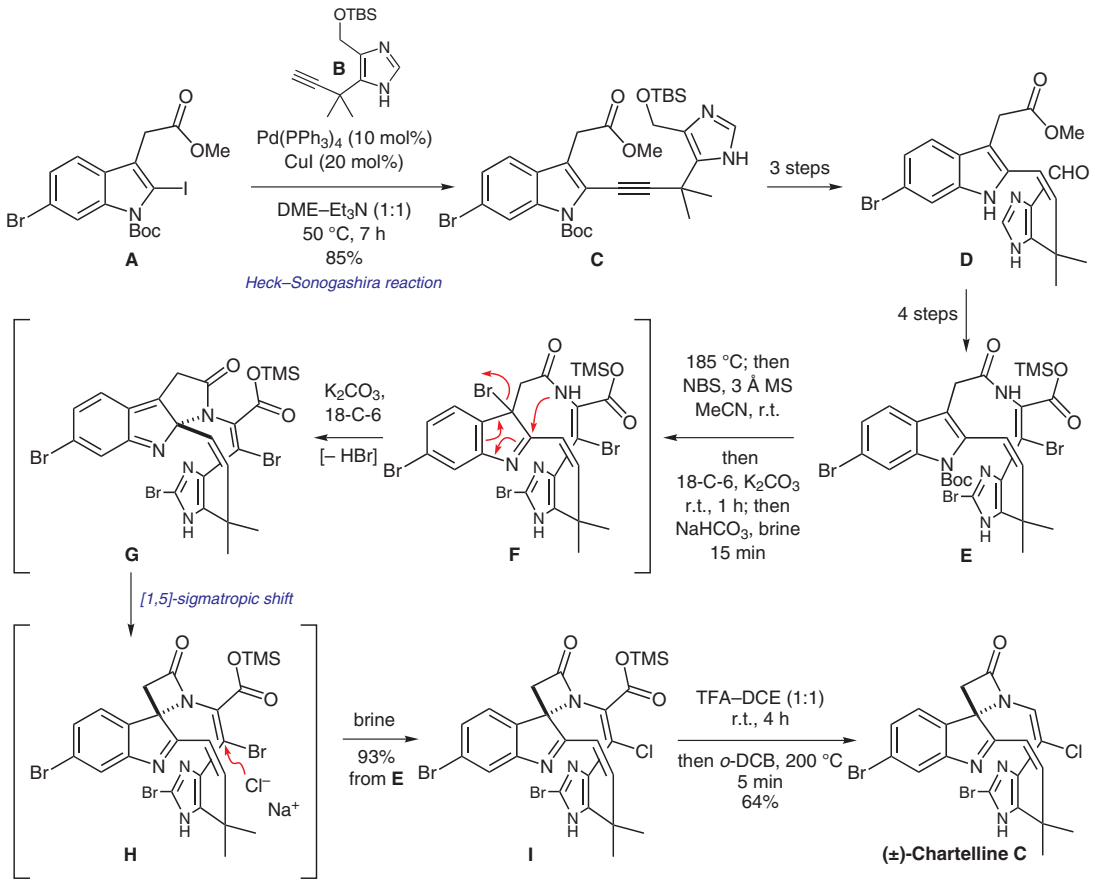
Synthesis of (±)-Chartelline C



Significance: Baran and co-workers previously postulated the biosynthetic origins of the chartellines (P. S. Baran et al. *Angew. Chem. Int. Ed.* **2005**, *44*, 3714-3717), and have now disclosed a bio-inspired approach to (±)-chartelline C, the scarcest member of the group. Noteworthy in this synthesis is a remarkable four-step, one-pot cascade sequence that affords the spiro-β-lactam system characteristic of the chartellines.

Comment: A Heck–Sonogashira reaction between indolyl iodide **A** and terminal alkyne **B** gave **C**, which was converted into macrocycle **E**, comprising the entire carbon scaffold of (±)-chartelline C. Thermolysis of **E** liberated the free indole that was treated sequentially with NBS and K_2CO_3/18-C-6 giving **G**. A [1,5]-sigmatropic N-shift ensued giving the ring-contracted spiro-β-lactam **H**, that, upon treatment with brine, underwent halogen exchange affording **I**. Silyl cleavage followed by thermal decarboxylation gave the target molecule.

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Category

Synthesis of Natural Products and Potential Drugs

Key words

Heck–Sonogashira reaction

bromination

ring contraction

[1,5]-sigmatropic shift

decarboxylation

SYNFACT of the month

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