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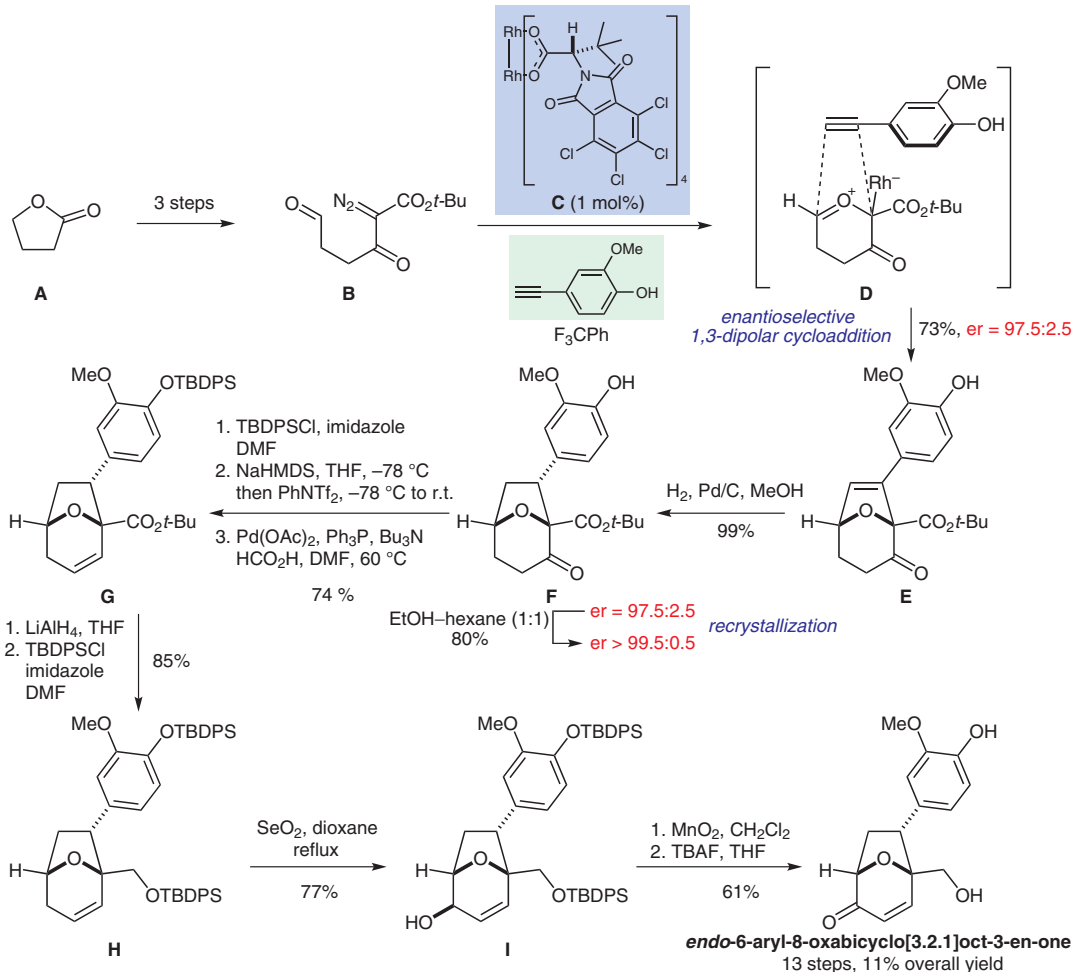
Catalytic Asymmetric Synthesis of the *endo*-6-Aryl-8-oxabicyclo[3.2.1]oct-3-en-2-one Natural Product from *Ligusticum chuanxing* via 1,3-Dipolar Cycloaddition of a Formyl-Derived Carbonyl Ylide Using Rh_2(*S*-TCPTTL)$_4$
J. Org. Chem. **2010**, *75*, 6039-6042.

Synthesis of *endo*-6-Aryl-8-oxabicyclo-[3.2.1]oct-3-en-2-one



Significance: This is the first example of an enantioselective 1,3-dipolar cycloaddition of a cyclic formyl carbonyl ylide. This methodology was successfully applied to the synthesis of *endo*-6-aryl-8-oxabicyclo[3.2.1]oct-3-en-2-one, which was isolated from *Ligusticum chuanxing Hort.*, a traditional Chinese medicine used to promote blood circulation.

Comment: The enantioselective 1,3-dipolar cycloaddition proceeds with impressive er (97.5:2.5) to form **E**. The reduced product **F** could then be recrystallized and the er upgraded to 99.5:0.5. The circular dichroism of the natural product differed from the synthetic sample, leading the authors to speculate that the natural product may be biosynthesized in racemic form.

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Synfacts 2010, 12, 1329-1329 Published online: 22.11.2010
DOI: 10.1055/s-0030-1258874; **Reg-No.:** N07210SF

Category
Synthesis of Natural Products and Potential Drugs

Key words
1,3-dipolar cycloaddition
ylides
catalytic asymmetric synthesis