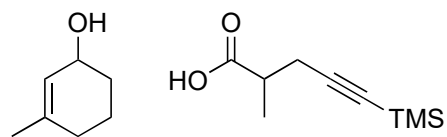
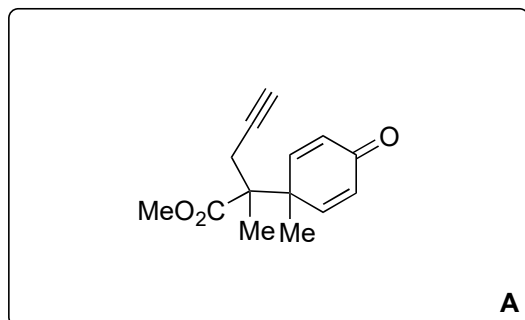


# Divergent Total Synthesis of Indoxamycins A, C, and F

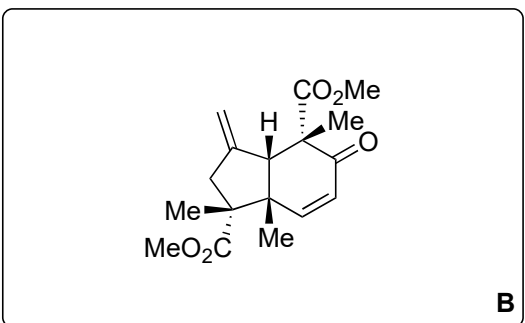
C. He, C. Zhu, Z. Dai, C. Tseng and H. Ding  
Angew. Chem. Int. Ed. **2013**, 52, 13256–13260



1-5



6-8



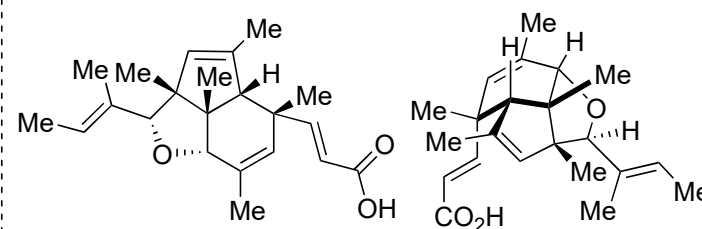
- 1) EDC·HCl, 4-DMAP
- 2) KHMDS, TMSCl, Et<sub>3</sub>N -78 °C → 70 °C then TMSCHN<sub>2</sub> (d.r. 1.5:1)
- 3) CrO<sub>3</sub>, 3,5-DMP
- 4) DDQ
- 5) K<sub>2</sub>CO<sub>3</sub>, MeOH

- 6) Pd<sub>2</sub>(dba)<sub>3</sub>, P(*o*-tol)<sub>3</sub>, Et<sub>3</sub>SiH, AcOH -78 °C
- 7) LiHMDS, Mander's reagent, -78 °C
- 8) NaH, MeI

- 2) Provide the name of this reaction.

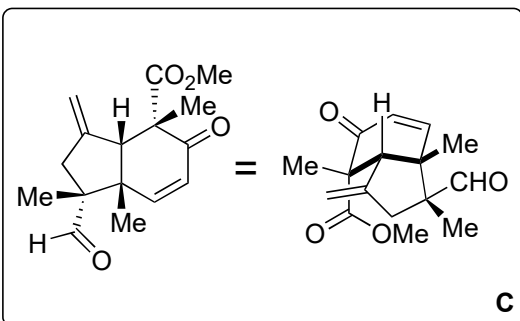
Ireland Claisen Rearrangement

Reference for methylation of carboxylic acid:  
Angew. Chem. Int. Ed. **2007**, 46, 7075–7077

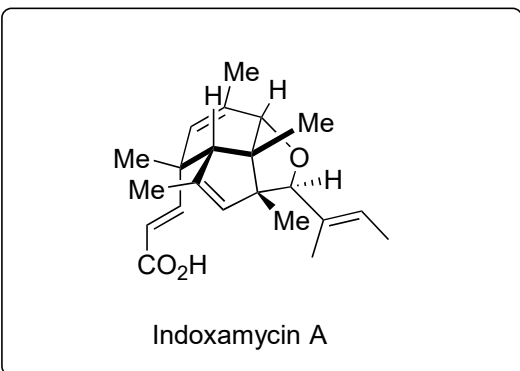


Indoxamycin A

9-10

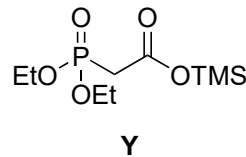
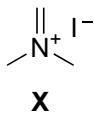


11-16



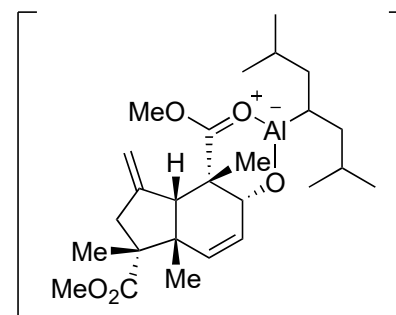
- 9) DIBAL, -78 °C  
10) DMP

- 11) (E)-2-butenyl-2-magnesium bromide, -78 °C  
then **X**  
12) *p*-TsOH·H<sub>2</sub>O  
13) PhNTf<sub>2</sub>, L-Selectride  
14) Pd(OAc)<sub>2</sub>, PPh<sub>3</sub>, NEt<sub>3</sub>, HCO<sub>2</sub>H,  
15) DIBAL  
16) **Y**, *n*BuLi



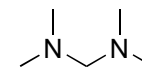
- 9) Explain the chemoselectivity of this reaction

The reaction likely proceeds through the following chelated transition state.



- 11) Provide a mechanism for this reaction

Hint:



is formed as a biproduct.

Angew. Chem. Int. Ed. **2013**, 52, 13256

- 16) What is the name of this reaction?

Horner Wadsworth Emmons  
Olefination

