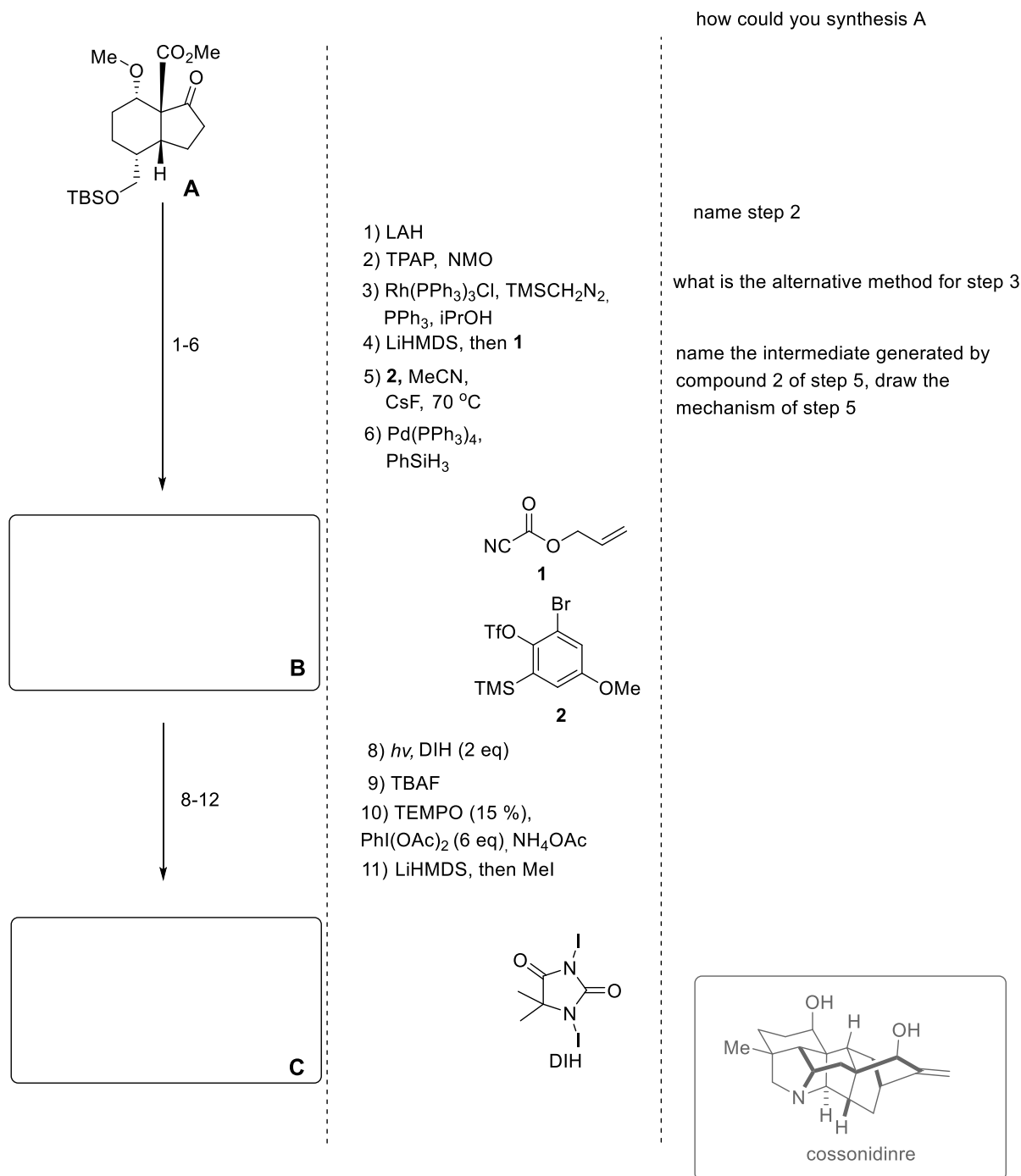


# A Benzyne-Insertion Approach to Hetsisine-Type Diterpenoid Alkaloids: Synthesis of Cossonidine (Davisine)

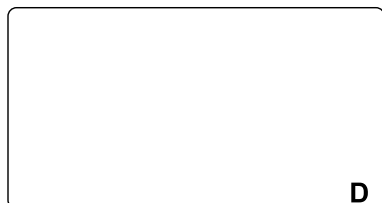
Kevin G. M. Kou, Jason J. Pflueger, Toshihiro Kiho, Louis C. Morrill, Ethan L. Fisher, Kyle Clagg, Terry P. Lebold, Jessica K. Kisunzu, and Richmond Sarpong\*

JACS, 2018, 140, 8105

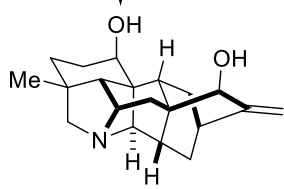


**C**

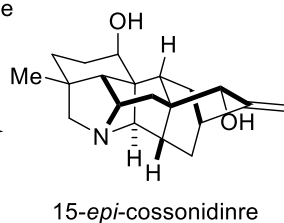
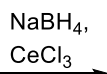
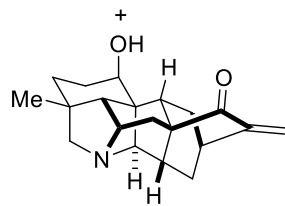
12-15



16-22

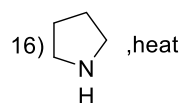


cossonidinre



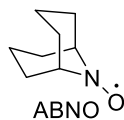
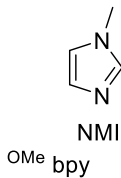
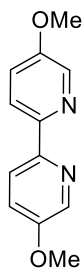
15-*epi*-cossonidinre

- 12) Co<sub>2</sub>B, BH<sub>3</sub>·tBuNH<sub>2</sub>, MeOH, heat
- 13) LAH (5 eq)
- 14) *n*-BuLi (6 eq), *hν*, *i*Pr<sub>2</sub>NH
- 15) Na, NH<sub>3</sub>(l), then HCl



- 17) HBr, AcOH
- 18) K<sub>2</sub>CO<sub>3</sub>, MeOH

- 19) Ph<sub>3</sub>P=
- 20) Cu(CH<sub>3</sub>CN)<sub>4</sub>OTf, ABNO, NMI, MeObpy, air, 50 °C
- 21) LAH
- 22) SeO<sub>2</sub>



hint: That the author used sequence step 12-13 is because a global reduction method failed by LAH  
step 14 is a photoredox reaction, please draw the mechanism

What is the function of step 17-18?

what is the function of step 20-21 sequence?