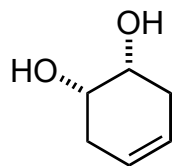
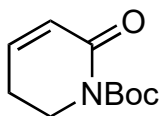
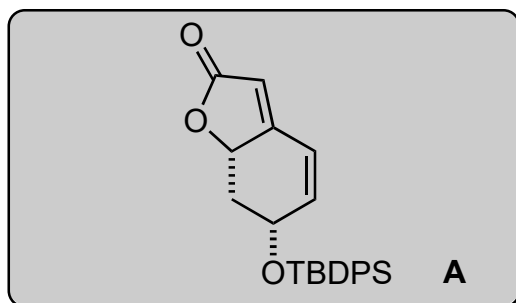


# Collective Total Synthesis of C4-Oxygenated Securinine-Type Alkaloids via Stereocontrolled Diversifications on the Piperidine Core

Park, S.; Kang, G.; Kim, C. Kim, D.; Han, S.  
*Nat. Comm.* **2022**, *13*, 5149.

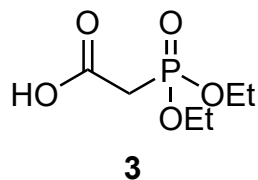
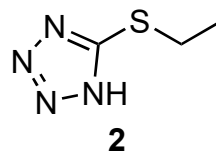
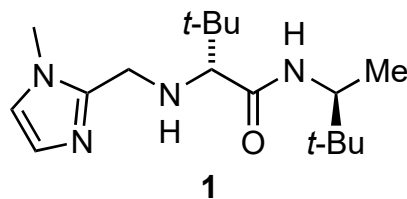


1-7



8-10

- 1) TBSCl, *i*-Pr<sub>2</sub>EtN, **1**, **2**
- 2) VO(OEt)<sub>3</sub>, TBHP
- 3) DMP, SiO<sub>2</sub>
- 4) TBDPSCI, imidzaole, DMAP
- 5) ZnBr<sub>2</sub>, H<sub>2</sub>O
- 6) **3**, EDCI
- 7) K<sub>2</sub>CO<sub>3</sub>, 18-crown-6

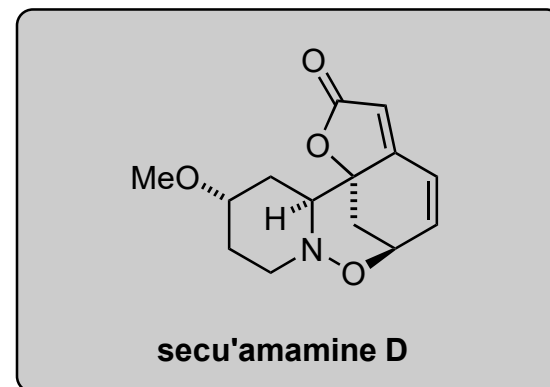


- 8) B<sub>2</sub>pin<sub>2</sub>, CuCl, NaOt-Bu, Taniaphos *then* NaBO<sub>3</sub>
- 9) Meerwein's salt, proton-sponge
- 10) LiEt<sub>3</sub>BH

3) HINT: Product is UV active

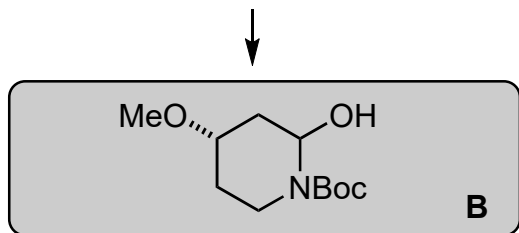
7) Name of the reaction?

Horner-Wadsworth-Emmons

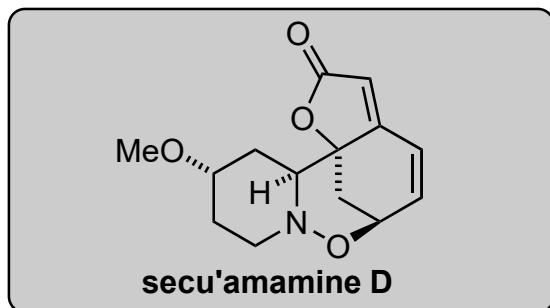


9) What is the structure of Meerwein's salt?



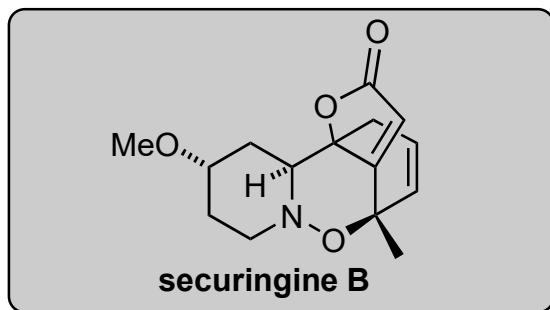


11-16



130 °C

370 nm



- 11) **A**, TIPSOTf,  $\text{NEt}_3$  then **B** then  $\text{Bu}_2\text{BOTf}$
- 12) TBAF
- 13) TFA
- 14)  $\text{NEt}_3$
- 15)  $\text{MsCl}$ ,  $\text{NEt}_3$
- 16) *m*-CPBA,  $\text{K}_2\text{CO}_3$

15) HINT: At this point, you should look retrosynthetically from secu-amamine D.

EXTRA CREDIT: Predict the product  
 Synthesis of Securingine B Enables  
 Photoresponsive Materials Design  
 Han *et al. Chem*,  
 DOI: 10.1016/j.chempr.2024.10.003