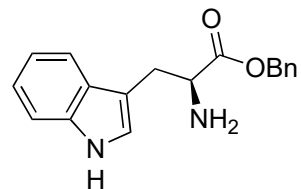
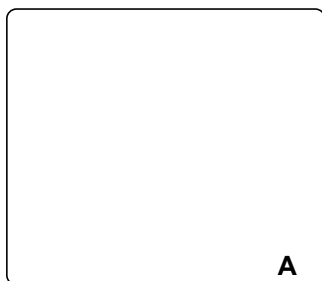


Enantioselective Synthesis of Iboga Alkaloids and Vinblastine Via Rearrangements of Quaternary Ammoniums

Yun Zhang, Yibin Xue, Gang Li, Haosen Yuan and Tuoping Luo*
Chem. Sci. **2016**, *7*, 5530–5536



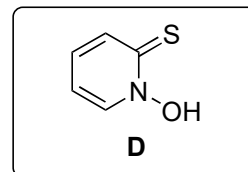
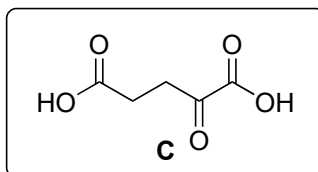
1-4



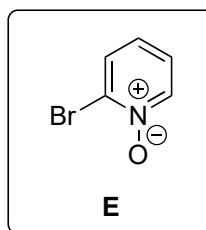
5-10



- C**, THF, reflux
- H₂, Pd/C (10% mol)
- isobutyl chloroformate, NMO, *then D*, Et₃N
- t*-butylthiol, 270W sun lamp



- Boc₂O
- LDA, propargyl bromide
- TFA
- Me₃O⁺BF₄⁻, *then* NaBH₄
- PPh₃AuNTf₂ (cat.), **E**, MsOH, AgOTf (cat.)
then NaHCO₃ (aq.), Et₃N
- t*-BuOK, Ph₃PEtBr

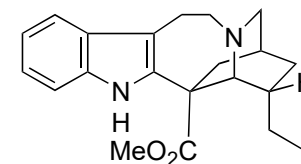


Step 1: What is the name of the amino acid that the starting material comes from? Name the reaction.

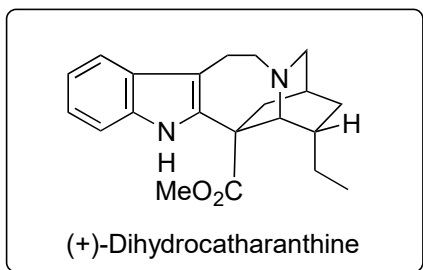
Step 4: Name the reaction

Step 9: During the basic treatment a second reaction happens followed by a rearrangement. Name the rearrangement and provide a mechanism.

Step 10: Name the reaction

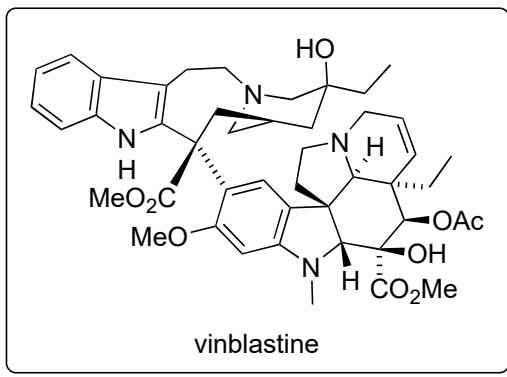


11

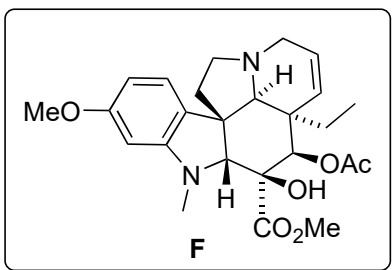


B

12



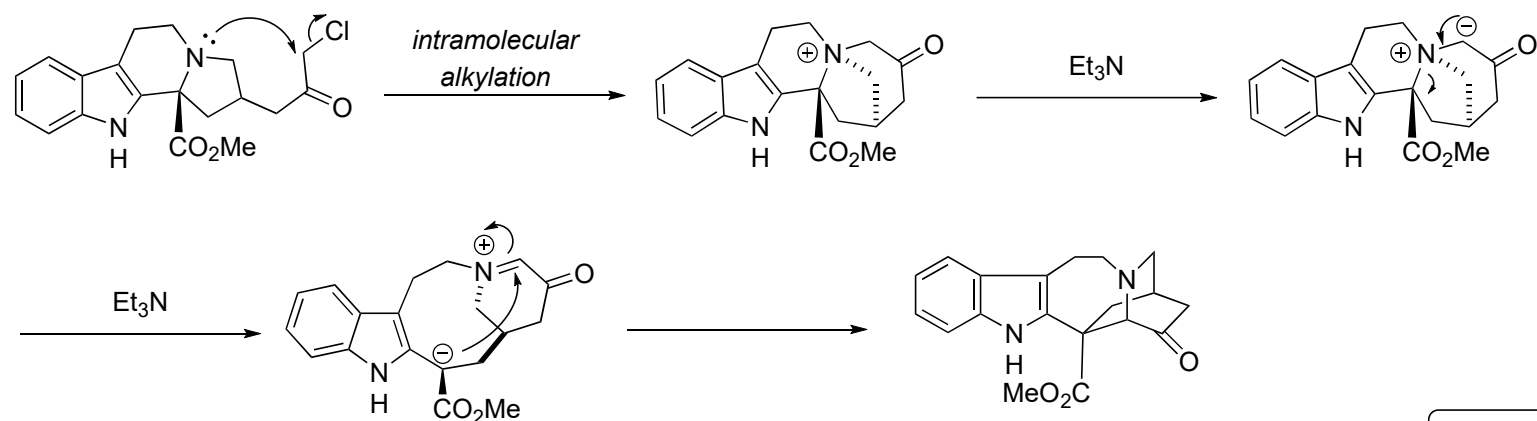
11) H₂, PtO₂



12) **F**, FeCl₃, 0.1N HCl-CF₃CH₂OH
then Fe₂(ox)₃, O₂, NaBH₄

Step 12: Propose a mechanism for this step

Step 9: [1,2]-Stevens rearrangement. Proposed mechanism:



Note: radical mechanism also plausible

Step 12: Oxidative coupling to vinblastine. Proposed mechanism.

