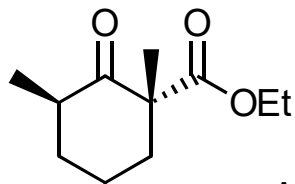
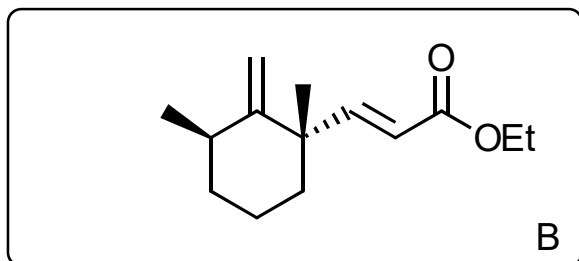


### Synthesis Challenge # 65

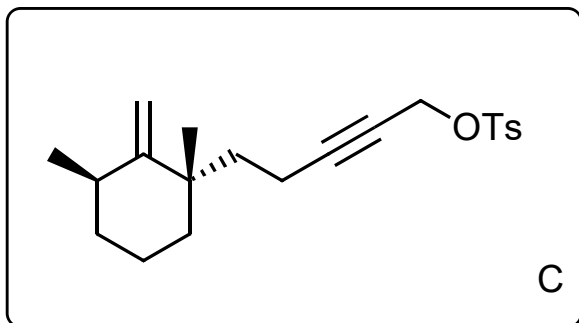
Total Synthesis of (+-)-Waihoensene, H. Lee, T. Kang, H.-Y. Lee, *Angew. Chem. Int. Ed.* **2017**, ASAP,  
DOI: 10.1002/anie.201704492  
22.06.2017



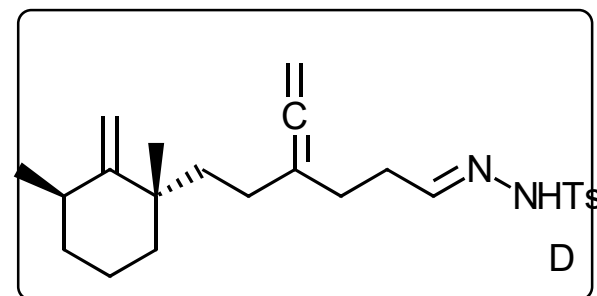
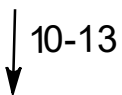
A



B



C



D

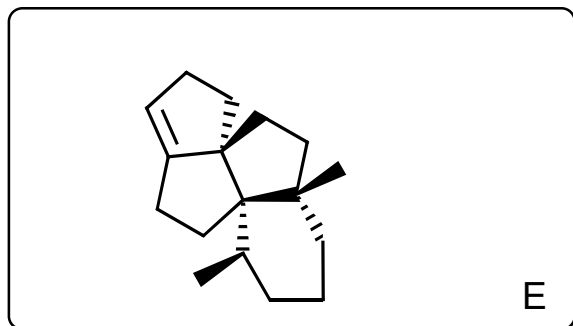
- 1) Zn, TiCl<sub>4</sub>, CH<sub>2</sub>I<sub>2</sub>, THF, DCM, 0°C to RT
- 2) LAH, Et<sub>2</sub>O, 0°C to RT
- 3) (COCl)<sub>2</sub>, DMSO, TEA, DCM, -78°C to RT
- 4) EtO<sub>2</sub>P(O)CH<sub>2</sub>CO<sub>2</sub>Et, NaH, THF, 0°C

- 5) Mg, MeOH, RT
- 6) DIBAL, DCM, -78°C to RT
- 7) CBr<sub>4</sub>, PPh<sub>3</sub>, DCM, 0°C
- 8) *n*-BuLi, (CH<sub>2</sub>O)<sub>n</sub>, THF, -78°C to RT
- 9) TsCl, KOH, Et<sub>2</sub>O, 0°C to RT

- 10) Mg, 1,2- dibromoethane, Br(CH<sub>2</sub>)<sub>3</sub>OTBS, CuCN, THF, 0°C
- 11) TBAF, THF, 0°C to RT
- 12) (COCl)<sub>2</sub>, DMSO, TEA, DCM, -78°C to RT
- 13) H<sub>2</sub>NNHTs, MeOH

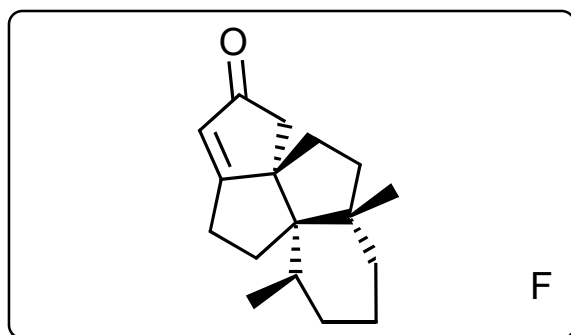
Please provide a synthesis for A.

14



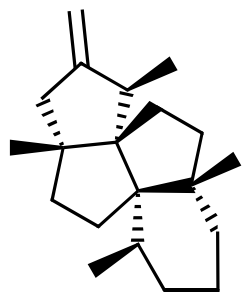
14) NaH, 0°C to reflux, toluene

15-18



15) OsO<sub>4</sub>, NMO, acetone, water, 0°C to RT  
16) TsCl, DMAP, DCM, RT  
17) DBU, DMF, 115°C  
18) PDC, DCM, RT

19-21



19) CuCN, MeLi, BF<sub>3</sub>·Et<sub>2</sub>O, THF, -78°C to -55°C  
20) LiHMDS, MeI, THF, -78°C to RT  
21) Cp<sub>2</sub>TiMe<sub>2</sub>, toluene, RT to 70°C

Please provide a nice 3D representation of the final product.