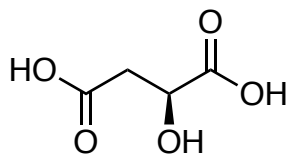


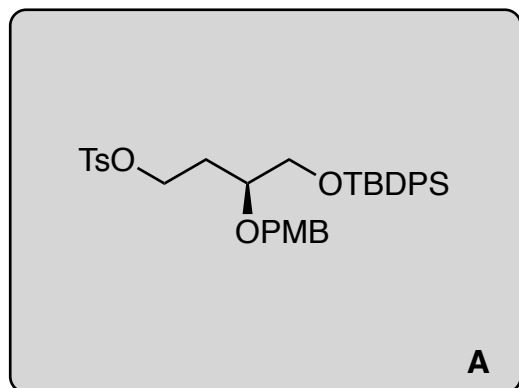
# Asymmetric Total Synthesis of (+)-6-*epi*-Castanospermine by the Stereoselective Formation of an *asyn,anti* Acetylenic 2-Amino-1,3-diol Stereotriad

Louvel, J.; Botuha, C.; Chemla, F.; Demont, E.; Ferreira, Fr.; Pérez-Luna, A.

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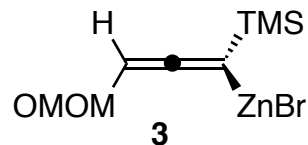
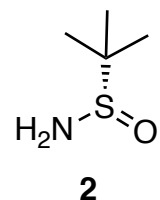
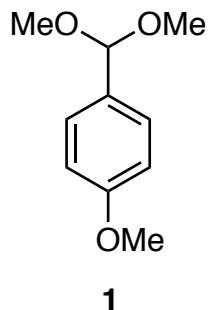


1-5



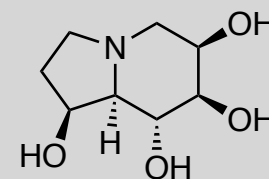
6-11

- 1)  $\text{BH}_3 \cdot \text{SMe}_2$
- 2) **1**, CSA
- 3) TBDPSCl, imidazole
- 4) DIBAL-H,  $-78^\circ\text{C}$
- 5) TsCl,  $\text{Et}_3\text{N}$

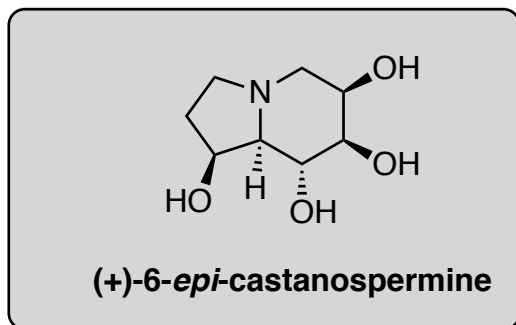
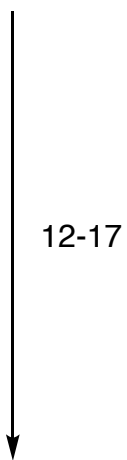
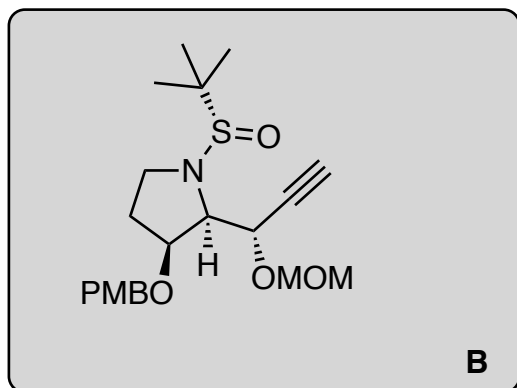


- 6) LiCl, acetone, *reflux*
- 7) TBAF
- 8) DMSO,  $(\text{COCl})_2$
- 9) **2**,  $\text{Ti}(\text{OEt})_4$
- 10) **3**,  $-78^\circ\text{C}$
- 11) NaH, 15-crown-5

- 1) Name of starting material:  
(*S*)-malic acid
- 2) Hint: A six-membered ring is formed
- 8) Name the reaction:  
Swern-oxidation
- 9) Name reagent **2**:  
Ellman's sulfonamide



**(+)-6-*epi*-castanospermine**



- 12) H<sub>2</sub>, Lindlar catalyst
- 13) HCl, MeOH, 0 °C, *then* NEt<sub>3</sub>, allyl bromide
- 14) Grubbs II
- 15) OsO<sub>4</sub>, NMO
- 16) HCl, MeOH, *reflux*
- 17) H<sub>2</sub>, Pd/C

- 13) Hint: Chemoselective hydrolysis
- 15) Name the reaction:  
Upjohn dihydroxylation

