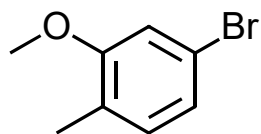


Synthesis Challenge #73

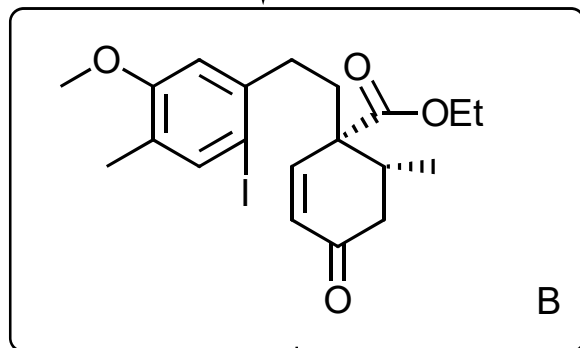
Total Synthesis of (±)-Cephanolides B and C via a Palladium-Catalyzed Cascade Cyclization and Late-Stage sp^3 C-H Bond Oxidation, L. Xu, C. Wang, Z. Gao, Y.-M. Zhao, *J. Am. Chem. Soc.* **2018**,

ASAP: DOI: 10.1021/jacs.8b03015

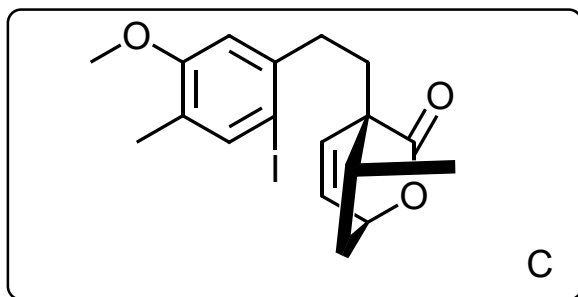
19.04.2018



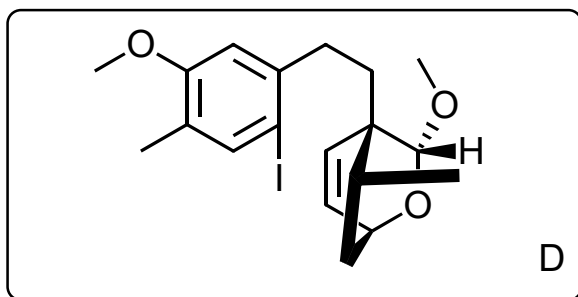
↓ 1-4 A



↓ 5-7



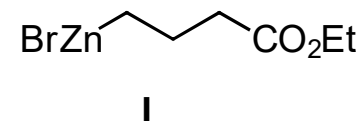
↓ 8-9



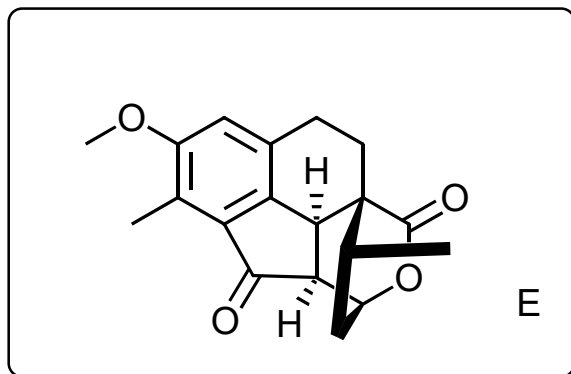
1) **I** (1.5 equiv), Pd(OAc)₂ (2.0 mol %), SPhos (4.0 mol %), THF, 50 °C, 8 h
 2) AgOAc (1.0 equiv), I₂ (1.0 equiv), HOAc, 12 h, rt
 3) LDA (1.5 equiv, 1.0 M in THF), HCOOMe (3.0 equiv), -78 °C → rt, 5 h
 4) 3-penten-2-one (1.5 equiv), Cu(OTf)₂ (0.2 equiv), THF, 50 °C

5) NaBH₄ (0.8 equiv), CeCl₃·7H₂O (1.2 equiv), MeOH, 0 °C, 2 h
 6) NaOH (10 equiv), MeOH/H₂O (v/v = 1:1), 70 °C, 12 h
 7) EDCl (1.2 equiv), DMAP (0.2 equiv), CH₂Cl₂, 0 °C → rt, 12 h

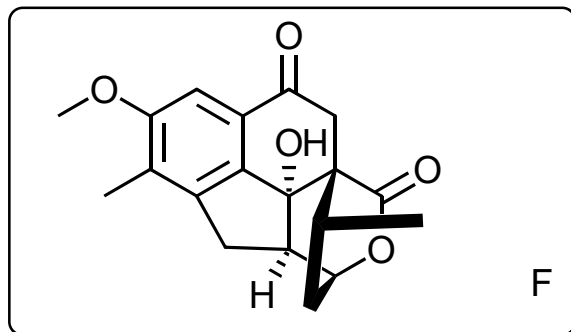
8) DIBAL-H (2.0 equiv), CH₂Cl₂, -78 °C
 9) PPTS (0.1 equiv), MeOH, 50 °C, 7 h



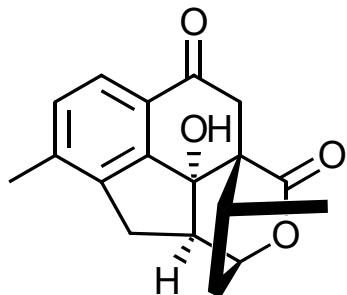
↓ 10-11



↓ 12-14



↓ 15-17



10) Pd(OAc)₂ (2.0 mol %), Ph₃P (4.0 mol %), CO (1 atm), K₂CO₃ (2.0 equiv), PhMe, 90 °C, 18 h
11) BF₃·OEt₂ (1.2 equiv), *m*-CPBA (1.5 equiv), CH₂Cl₂, 0 °C, 1 h, then Et₃N (3.0 equiv), 0 °C → rt, 5 min

12) TfOH (10.0 equiv), Et₃SiH (10.0 equiv), CH₂Cl₂, rt, 40 h
13) DDQ (2.0 equiv), 1:1 CH₂Cl₂/H₂O
14) PCC (4.0 equiv), NaOAc (5.0 equiv), PhH, 70 °C, 12 h,

15) BCl₃ (5.0 equiv), TBAI (4.0 equiv), CH₂Cl₂, -78 → -40 °C, 4 h
16) Tf₂O (1.2 equiv), pyr. (1.5 equiv), CH₂Cl₂, 0 °C, 1 h
17) Pd(OAc)₂ (10 mol %), dppp (10 mol %), Et₃SiH (2.5 equiv), DMF, 60 °C, 8 h

dppp = 1,3-bis-(diphenylphosphino)-propane