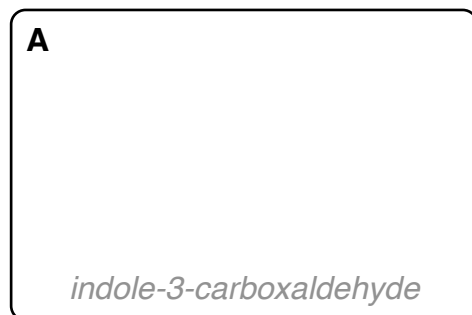


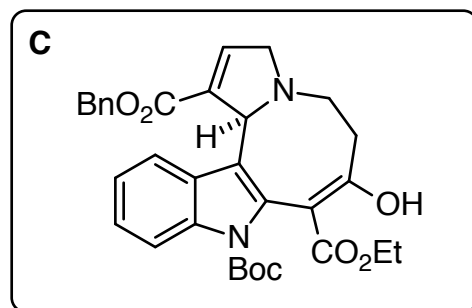
Catalytic Asymmetric Total Synthesis of (-)-Actinophyllic Acid
L. Cai, K. Zhang, and O. Kwon* - *J. Am. Chem. Soc.* **2016**, *138*, 3298–3301.



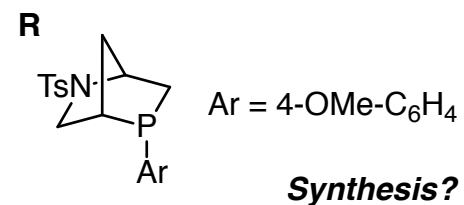
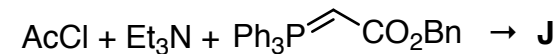
↓ 1-4



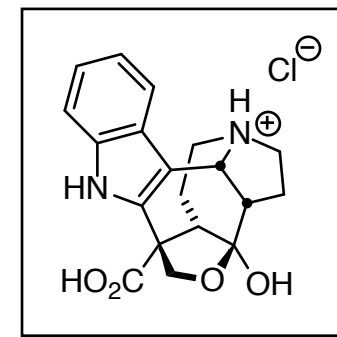
↓ 5-7



- 1) Boc_2O , DMAP
- 2) 2-nitrobenzenesulfonamide
 Et_3N , TiCl_4
- 3) **J**, **R** (20 mol %), (*S*)-BINOL } *Mechanism?*
(99% yield, 94% ee)
- 4) $\text{Hg}(\text{O}_2\text{CCF}_3)_2$, KI then I_2

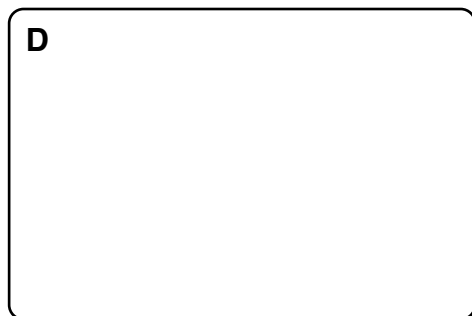


- 5) PhSNa
- 6) ethyl 3-oxopent-4-enoate
- 7) CuI (20 mol %), K_2CO_3 , DMSO
RT (recrystallization \rightarrow 99% ee)



8-10
↓

- 8) Pd/C, MeOH, 180 psi H₂ [2 transformations take place]
- 9) chloriodomethane, K₂CO₃
- 10) NaI (40 equiv.), K₂CO₃
DMF, 75 °C (35–48%)



11-14
↓

- 11) SmI₂, *t*-BuOH (10 equiv.)
THF (95%) *Reaction Name?*
- 12) thiophosgene, DMAP
- 13) *n*-Bu₃SnH, AIBN, 90 °C
- 14) aq. 4M HCl, μw, 100 °C

