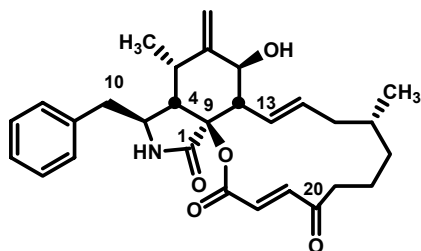


Cytochalasins

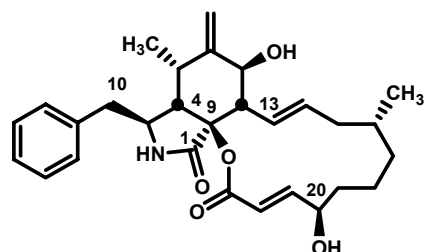
Ke Li

Group Meeting 01/18/06

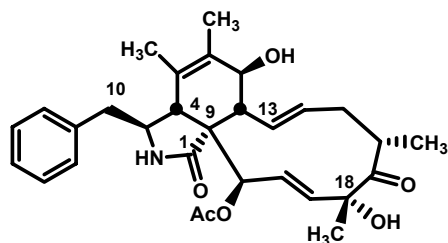
Cytochalasins (Greek *cytos*, cell; *chalis*, relaxation) are a family of fungal metabolites with complex and diverse molecular structure and various biological activities. The common structure motif shared among different members is a rigid bicyclic isoindolone core which is fused to a macrocycle. The different macrocyclic structures are believed to play an important role in the determination of biological activity. Most of cytochalasins are commercially available now for biological studies, which explains why there are only a few total synthesis in the field.



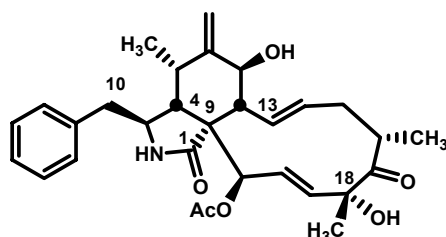
Cytochalasin A



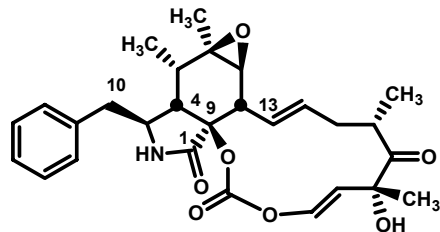
Cytochalasin B



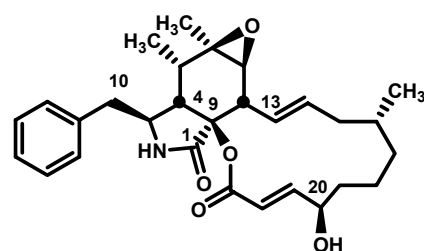
Cytochalasin C



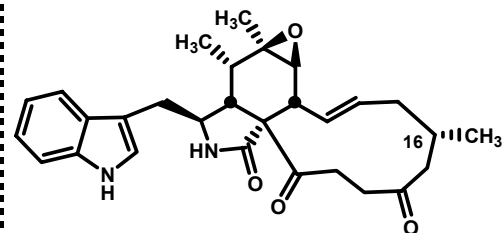
Cytochalasin D



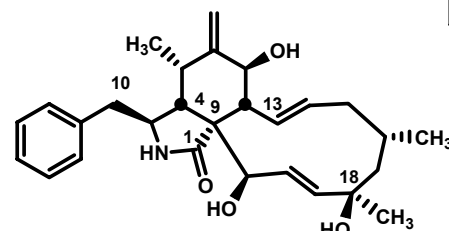
Cytochalasin E



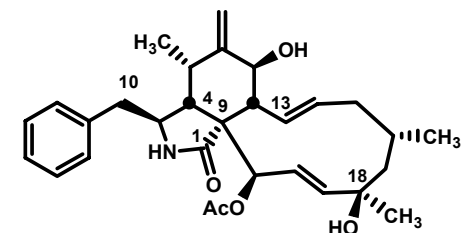
Cytochalasin F



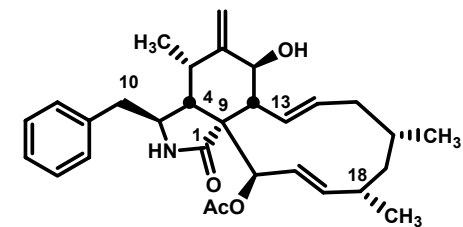
Cytochalasin G



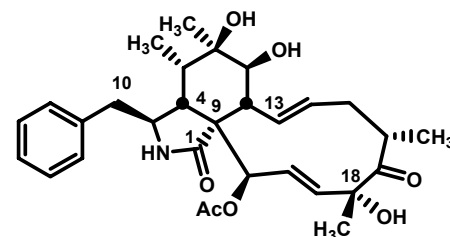
Cytochalasin J



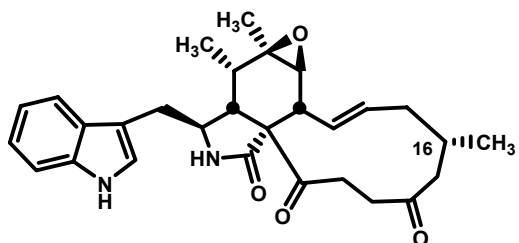
Cytochalasin H



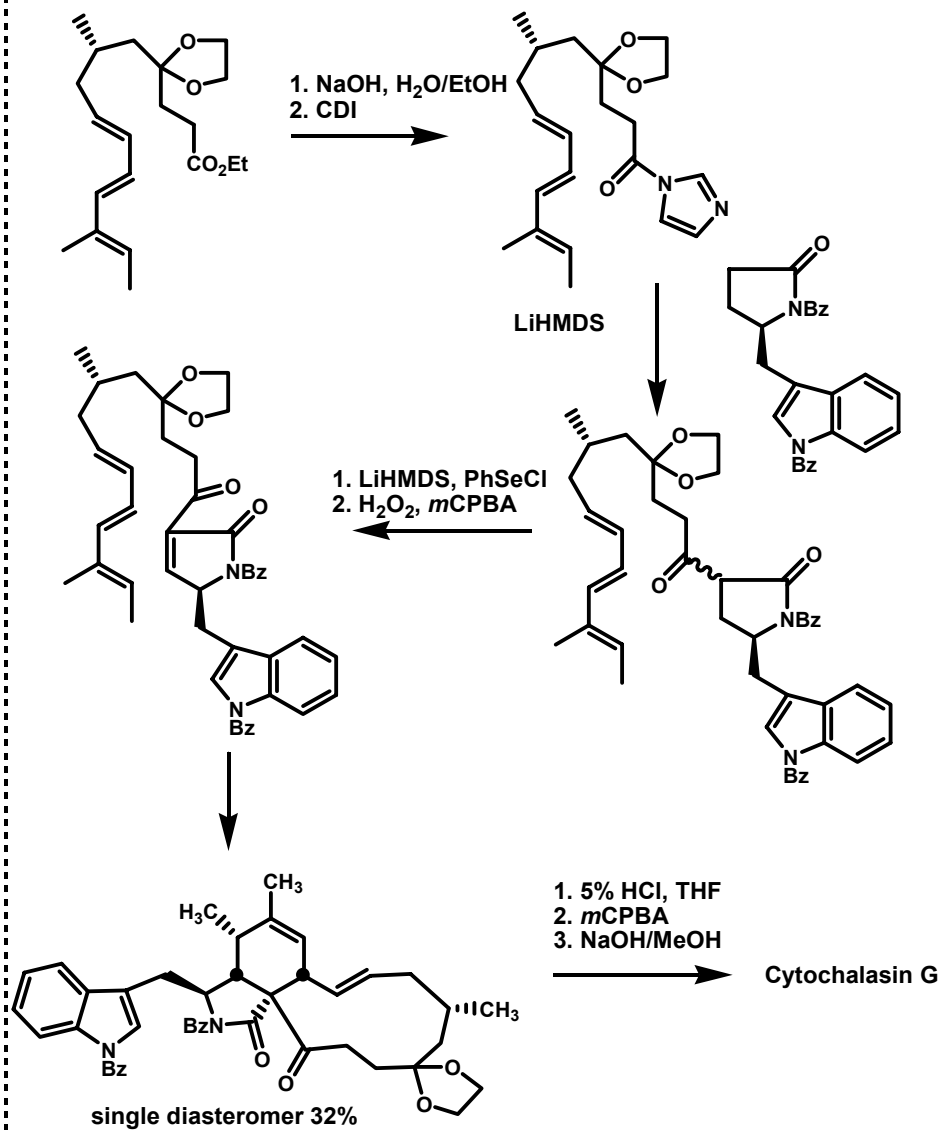
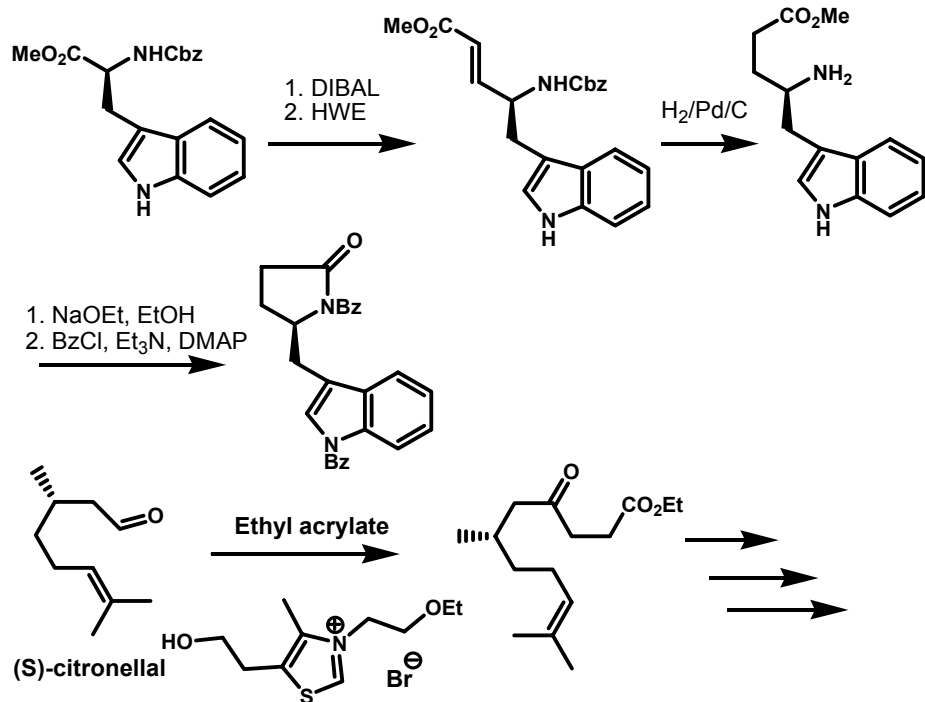
L-696,474

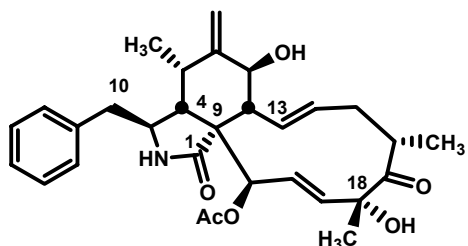


Cytochalasin O



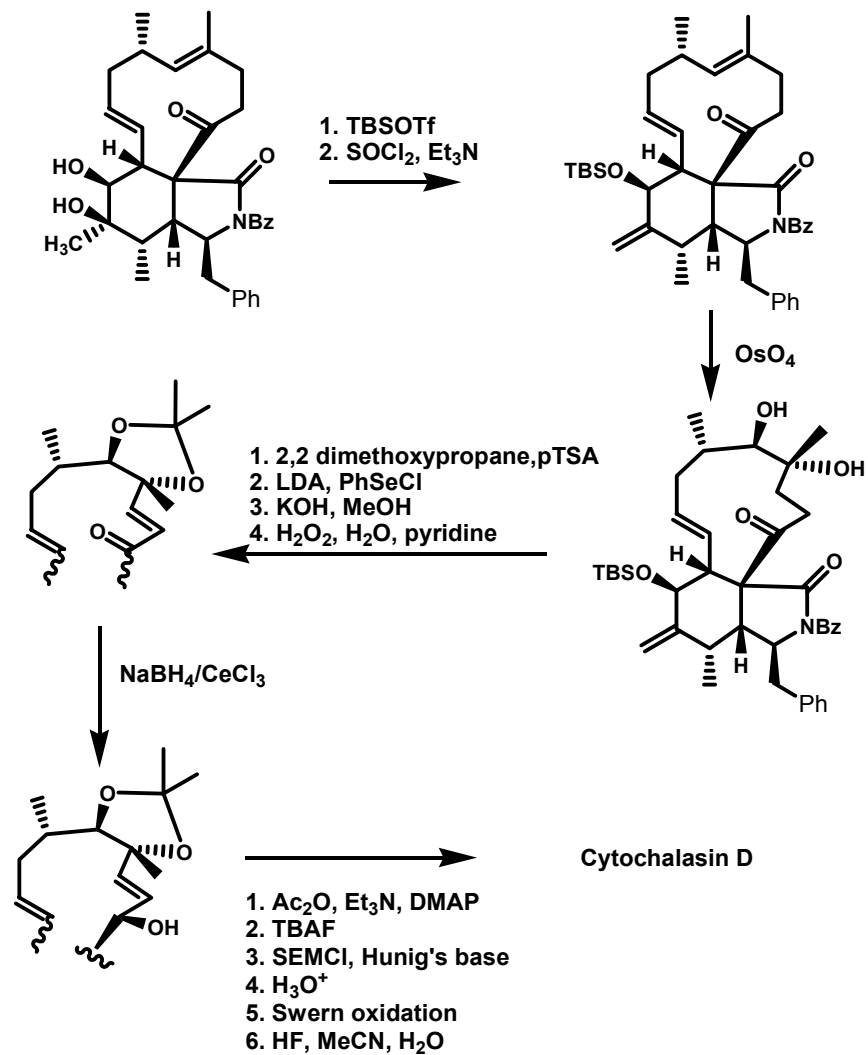
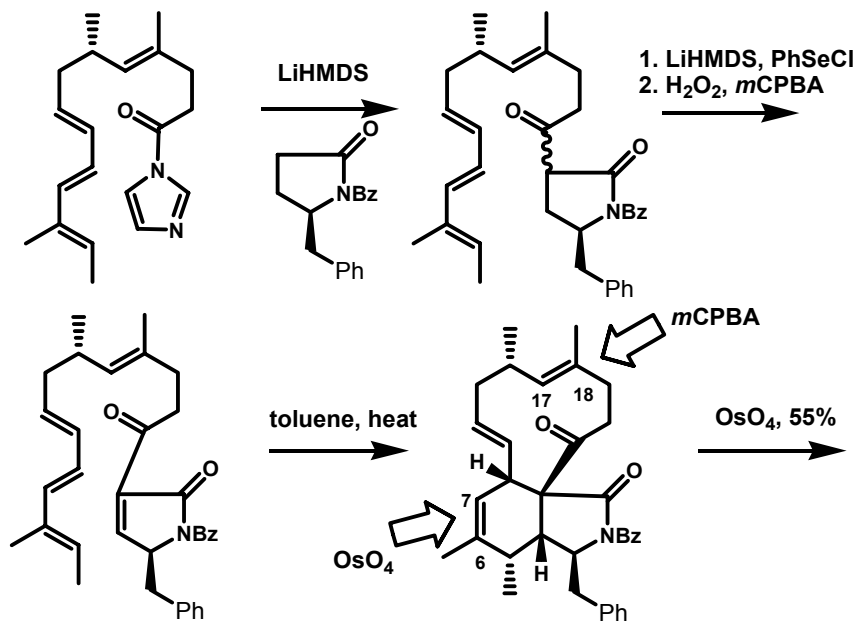
Cytochalasin G

Thomas, E.J. and coworkers *J. Chem. Soc. Chem. Comm.* 1986, 1447

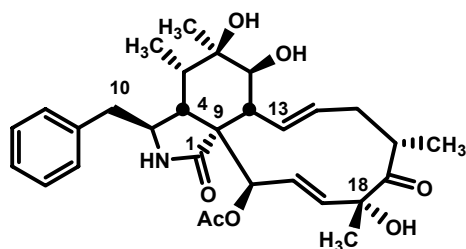


Cytochalasin D

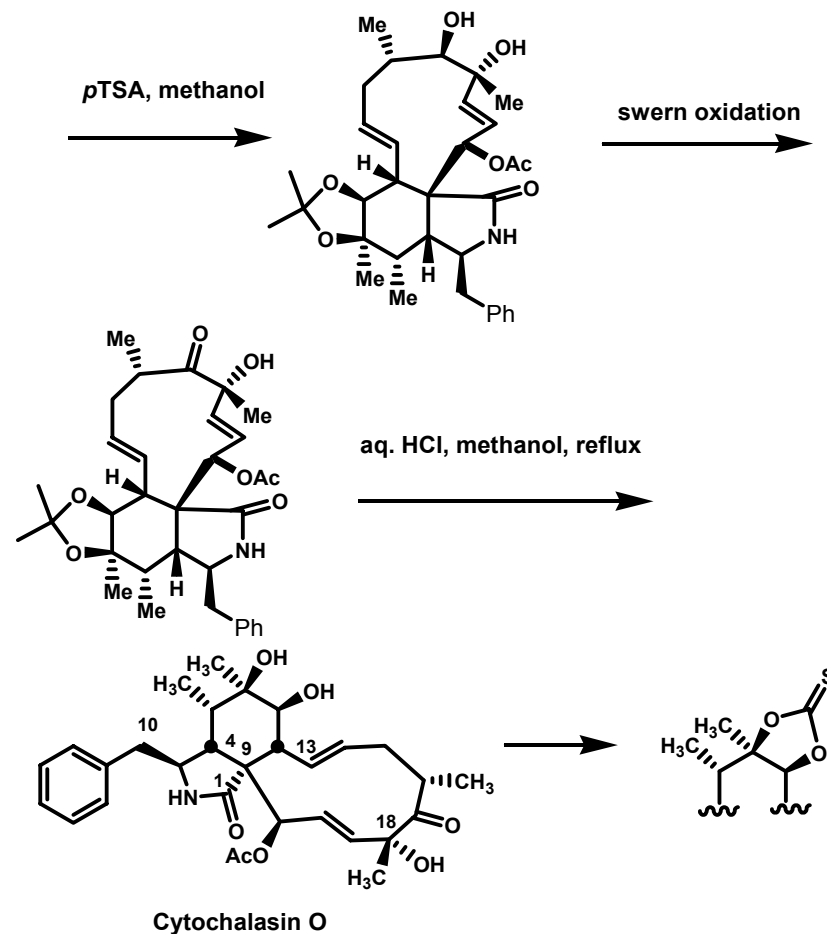
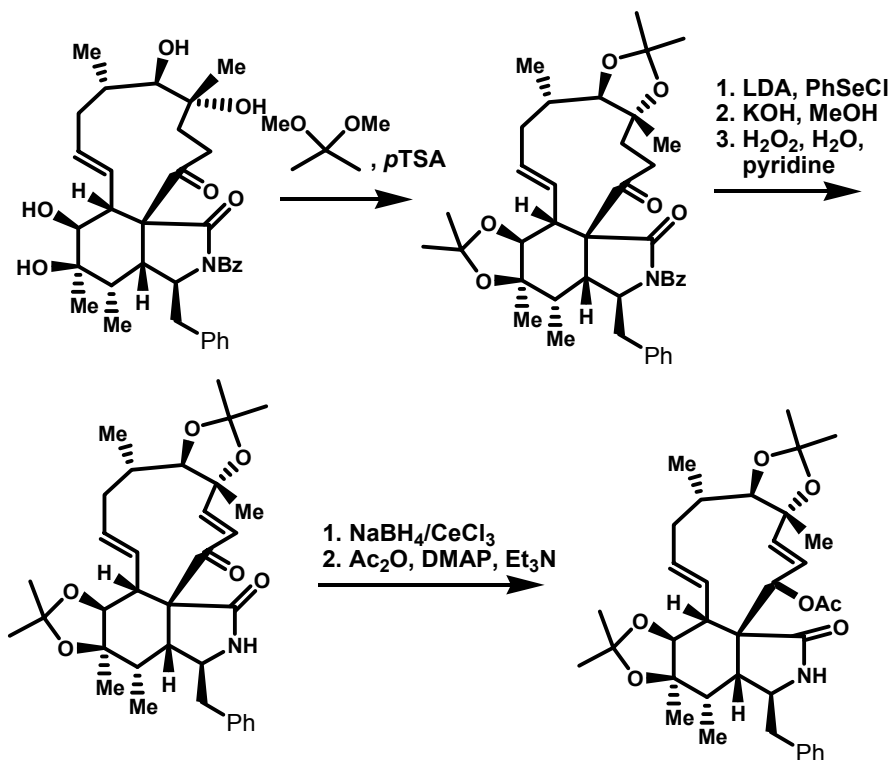
Thomas, E.J. and coworkers *J. Chem. Soc. Chem. Comm.* 1990, 464



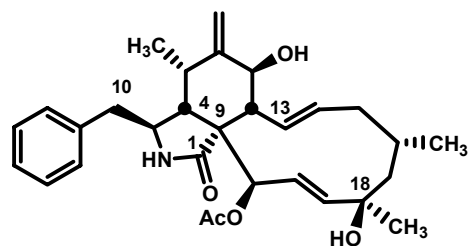
Cytochalasin D



Cytochalasin O

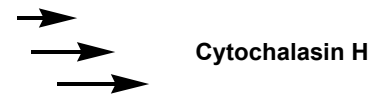
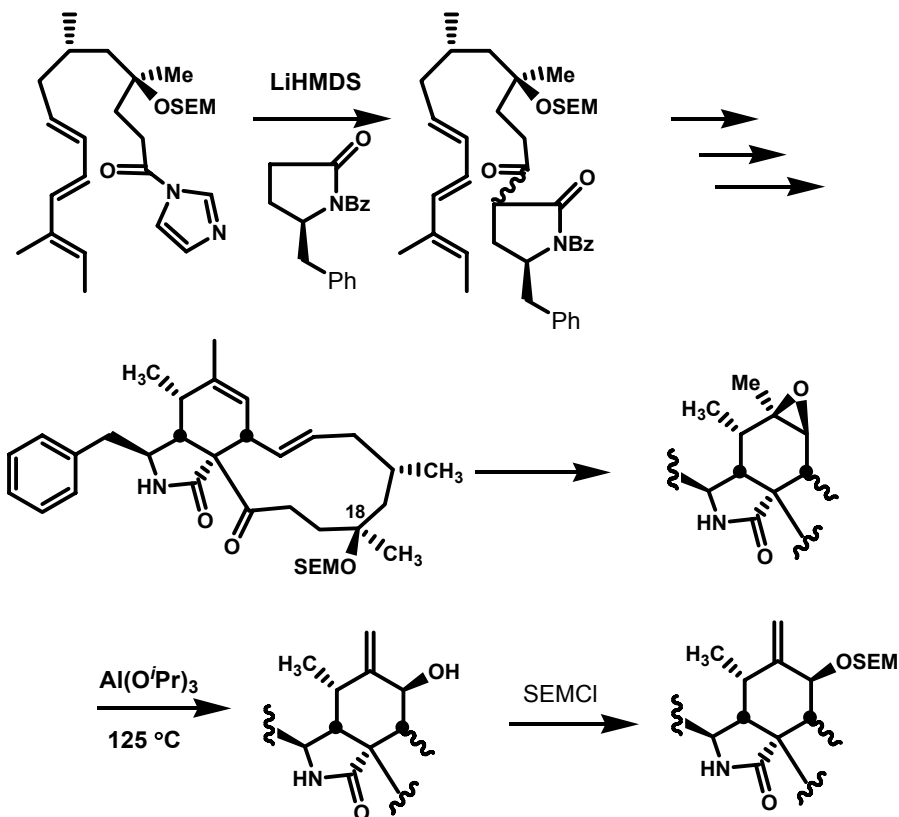
Thomas, E.J. and coworkers *J. Chem. Soc. Perkins Trans. 1*, 1999, 3269

absolute configuration was confirmed by total synthesis

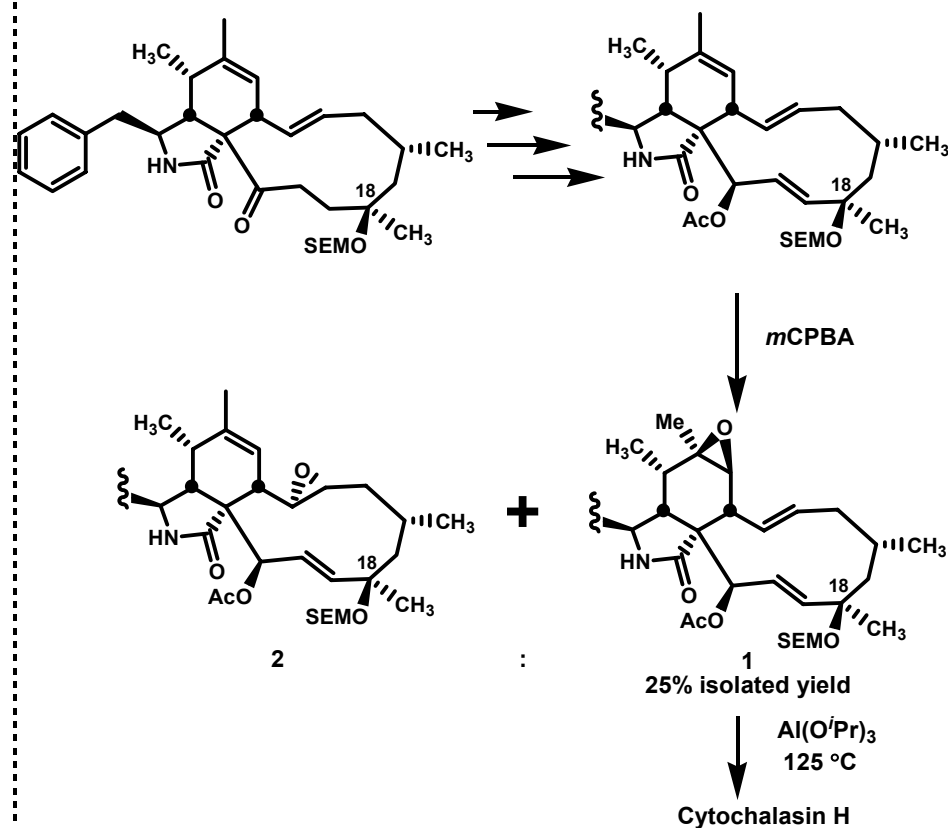


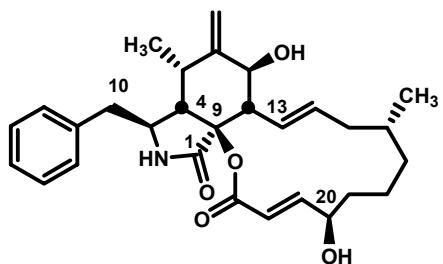
Cytochalasin H

Thomas, E.J. and coworkers *J. Chem. Soc. Chem. Comm.* 1986, 724, 727



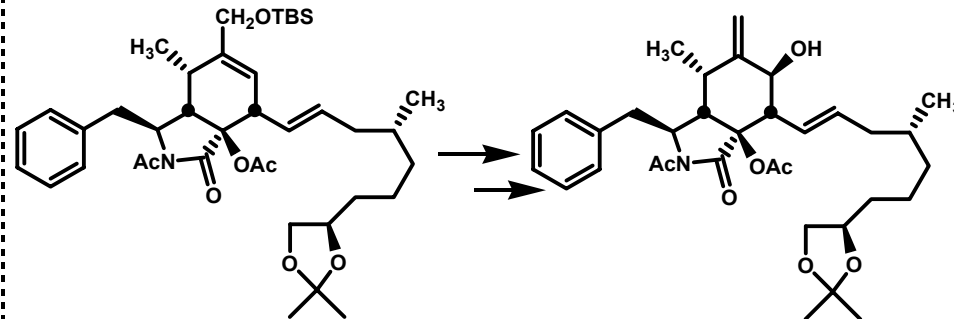
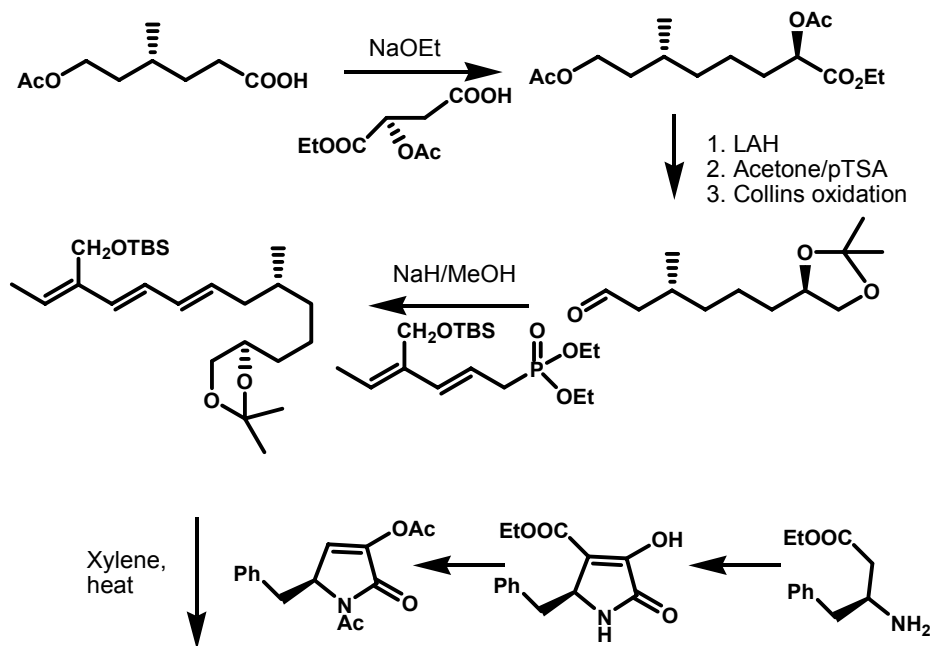
Alternative route:



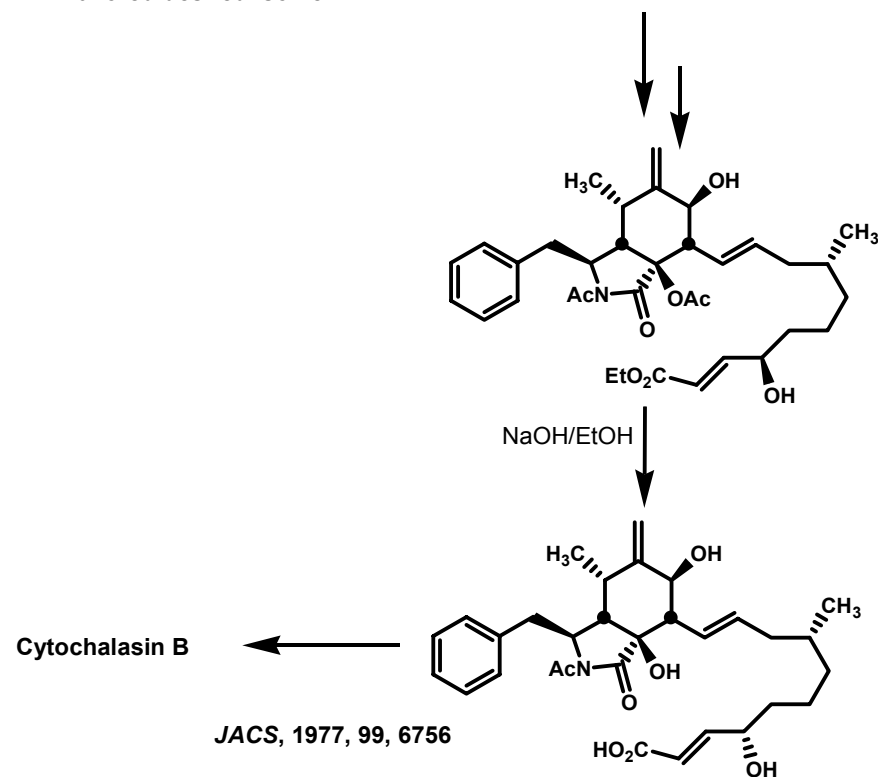


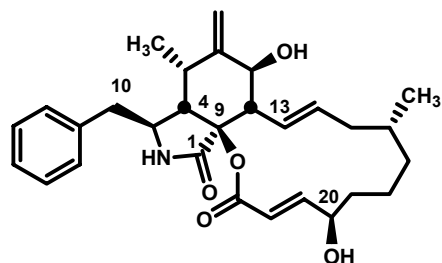
Cytochalasin B

Stork, JACS, 1978, 100, 7775

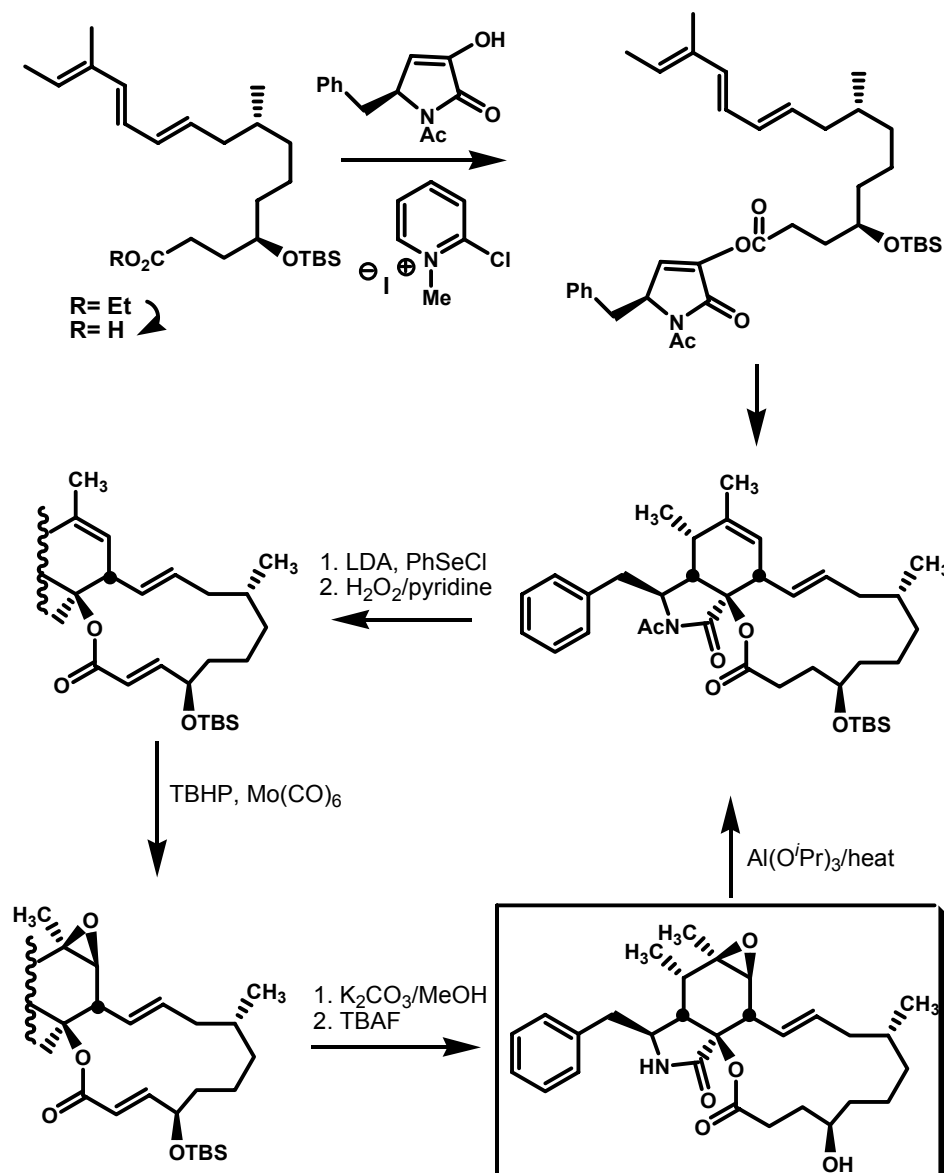
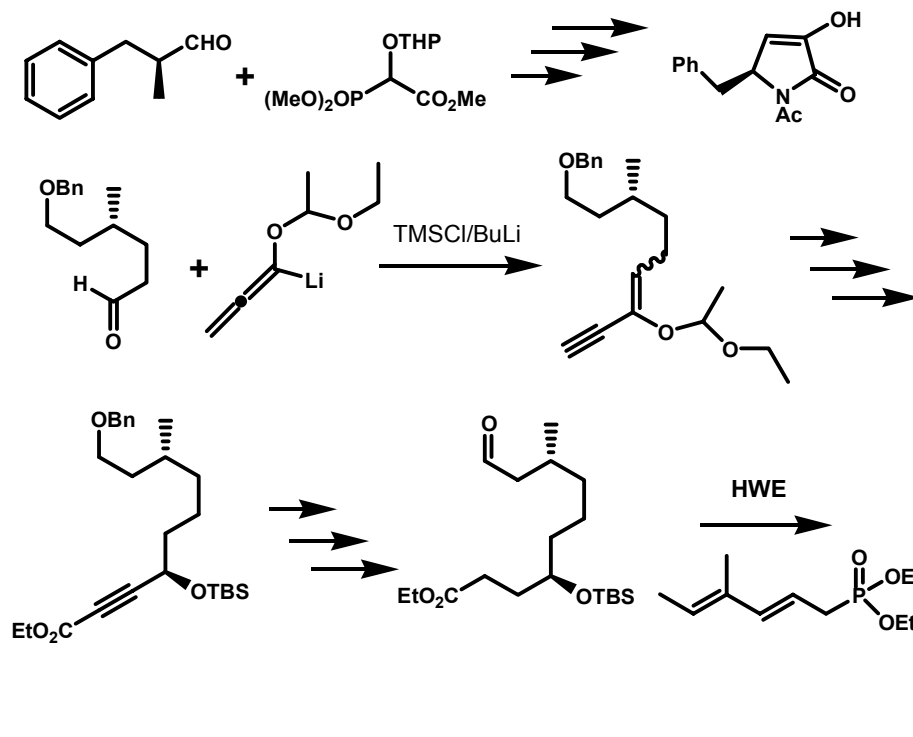


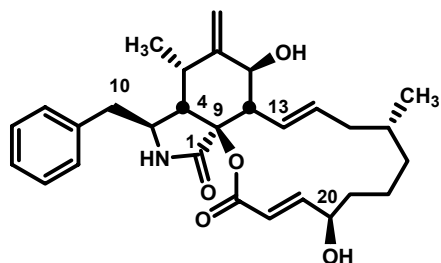
4:1 favored desired isomer





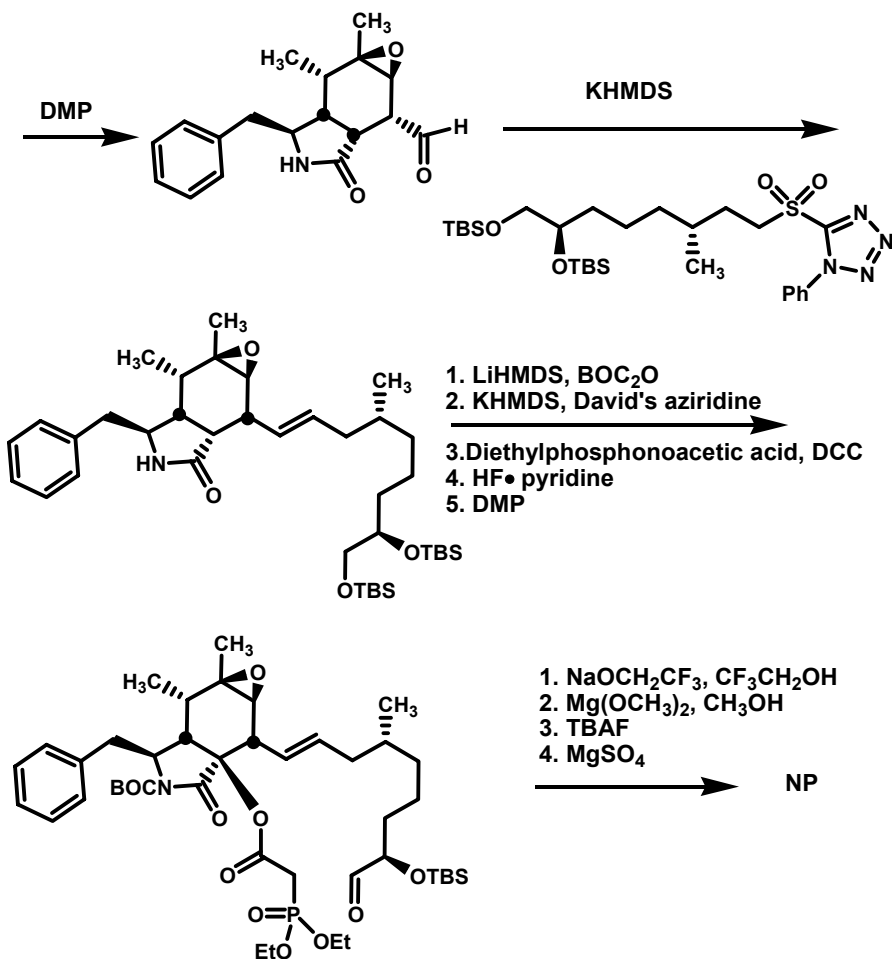
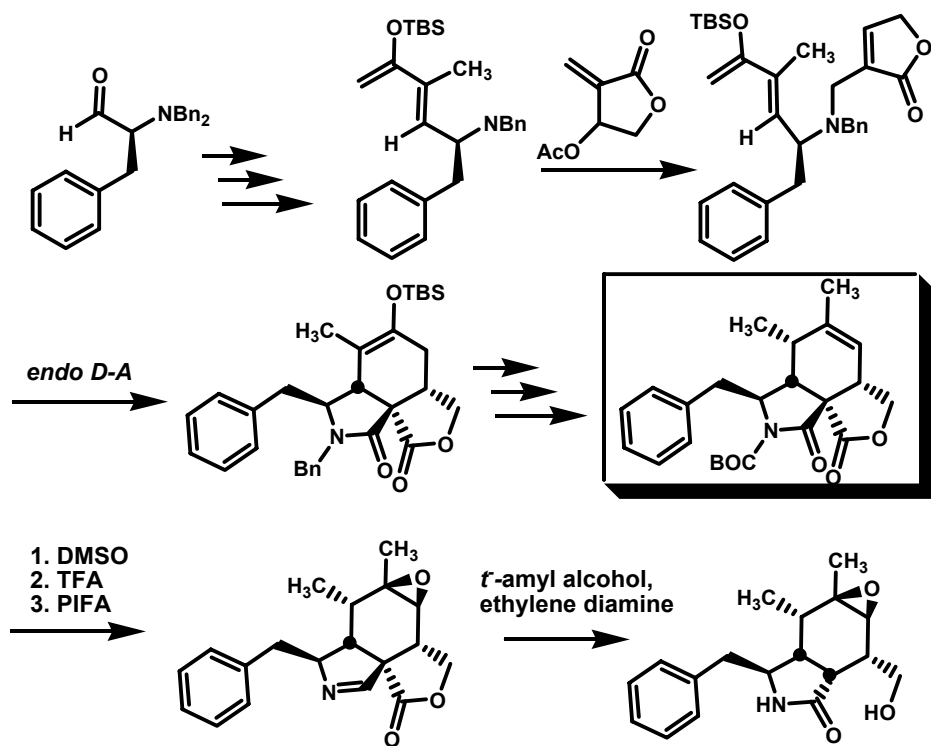
Cytochalasin B

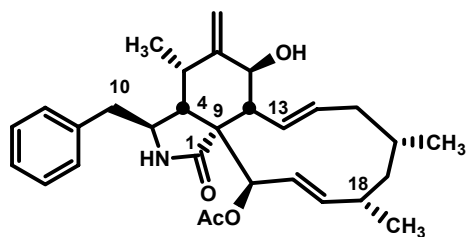
Stork, *JACS*, 1983, 105, 5510



Cytochalasin B

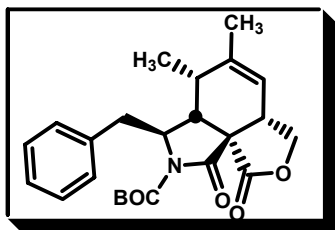
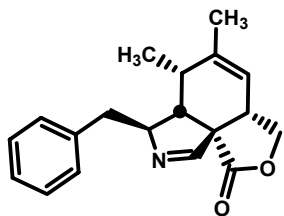
Myers, PNAS, 2004, 101, 12048



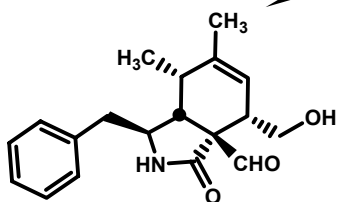
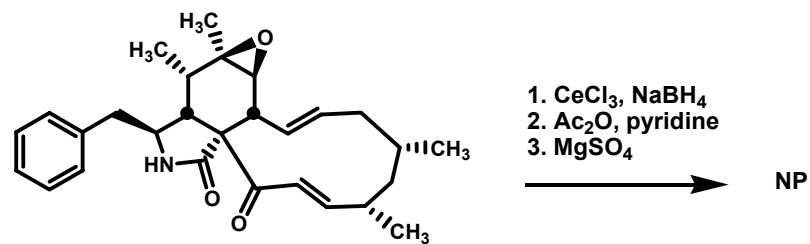
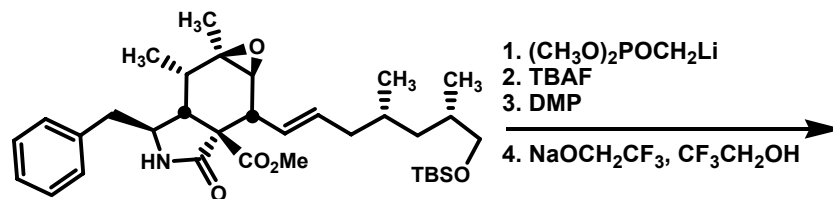
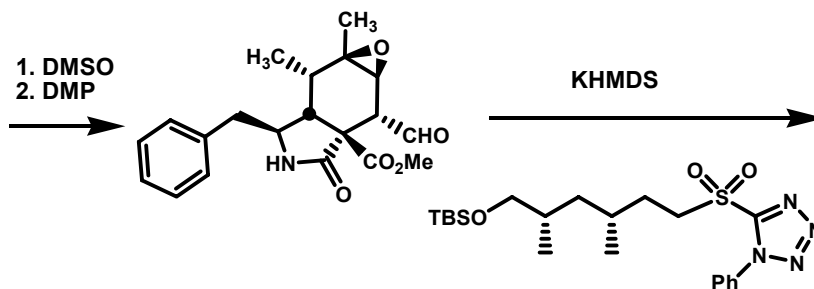
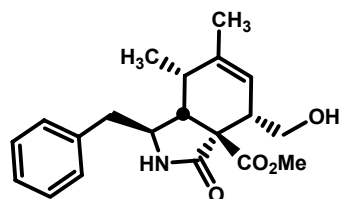


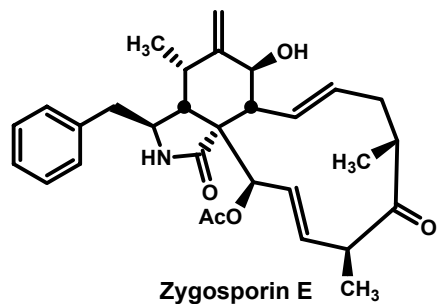
L-696,474

Myers, PNAS, 2004, 101, 12048

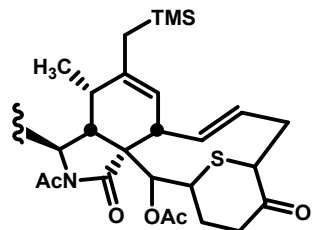
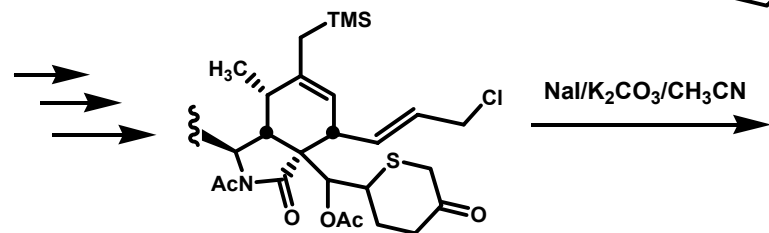
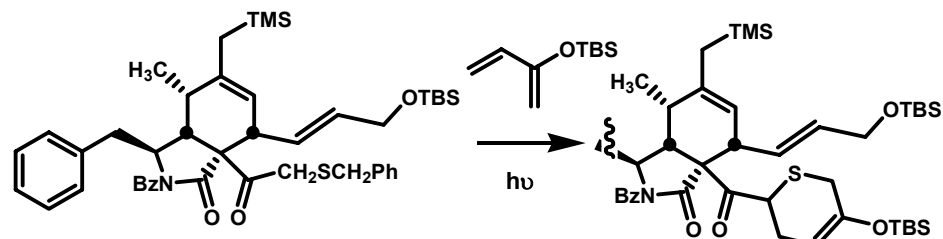
1. TFA
2. PIFAEtCO₂Et/H₂O

AcOH

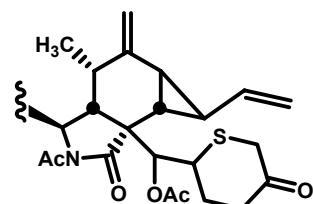
1. 1,3-diaminopropane,
CF₃CH₂OH then pH 7
buffer
2. KOH, I₂, CH₃OH



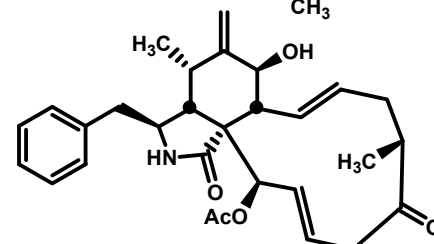
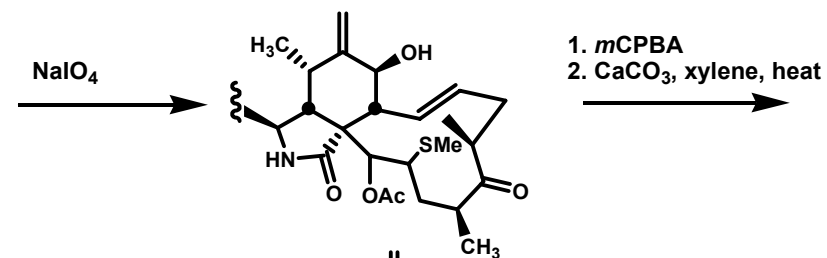
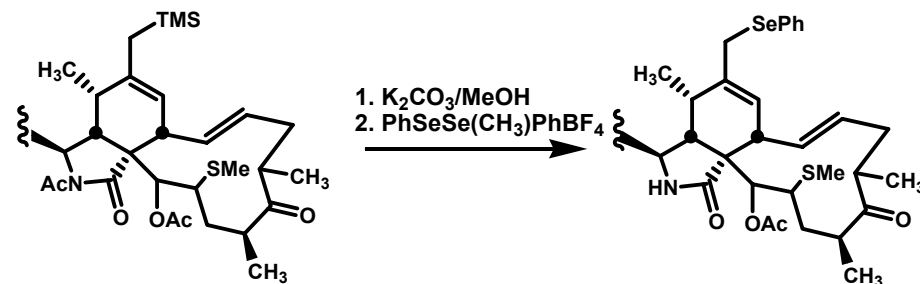
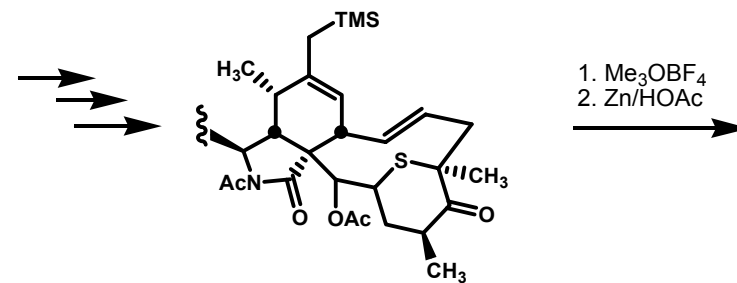
Vedejs, E. *et al*, *JACS*, 1984, 106, 4617
JACS, 1988, 110, 4822



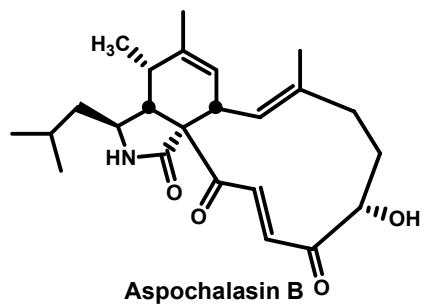
desired product 71%



side product 9%



Zygospurin E



Trost, B.M.. *et al*, *JACS*, 1989, *111*, 8281

