

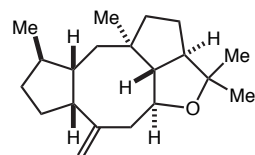
Synthetic Approaches to Eight Membered Rings via Carbon-Carbon Bond Manipulation

D. H. B. Ripin 11/95

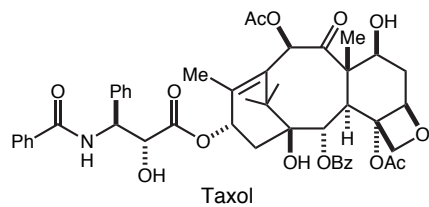
- I. The synthetic challenge
- II. Intramolecular cyclization
- III. Ring contraction of larger rings
- IV. Fragmentations of bicyclic ring systems
- V. Ring expansion of smaller rings

Leading References:

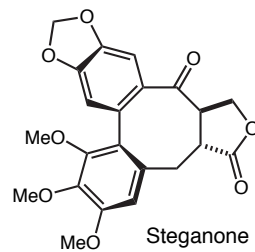
Petasis, Patane *Tetrahed.* **1992**, 5757
Swindell *Org. Prep. Proc. Int.* **1991**, 465.
Oare Evans Group Seminar **1991**.



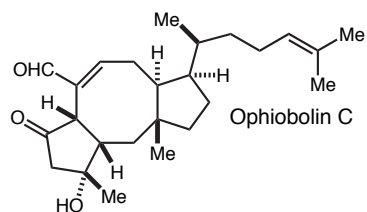
(+) epoxydictymene



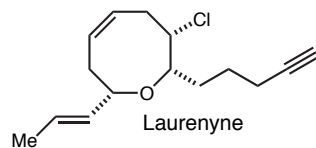
Taxol



Steganone



Ophiobolin C

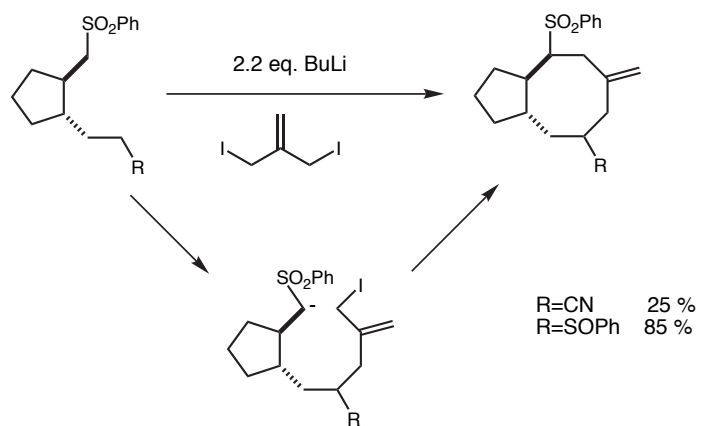


Laurenyne

Intramolecular cyclization routes to eight membered rings



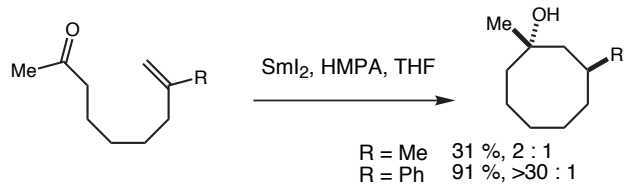
Sulfone alkylation:



■ cis olefins, fused rings, and large substituents facilitate the gauche relationships required for cyclization.

Lansbury *TL*1990, 3965.

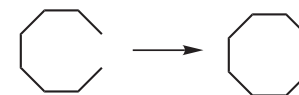
Radical cyclization



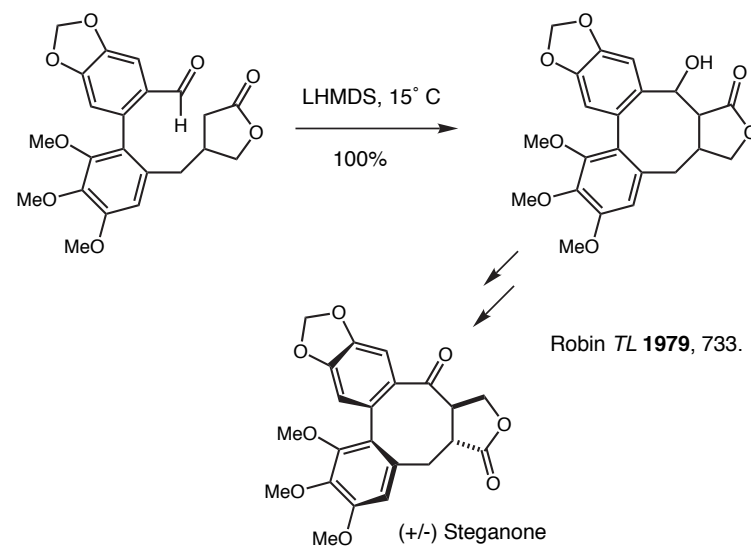
8-endo trig closure preferred over 7-exo.

Molander *JOC* 1994, 3189.

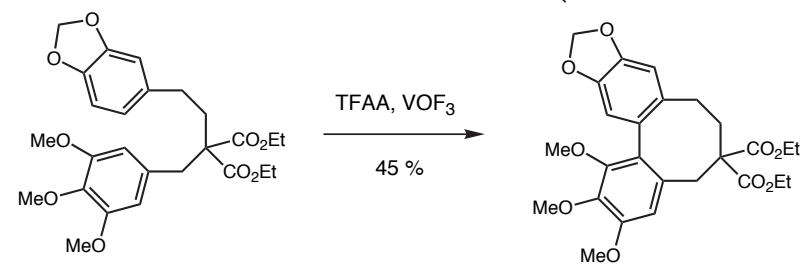
Intramolecular cyclization routes to eight membered rings



Aldol:

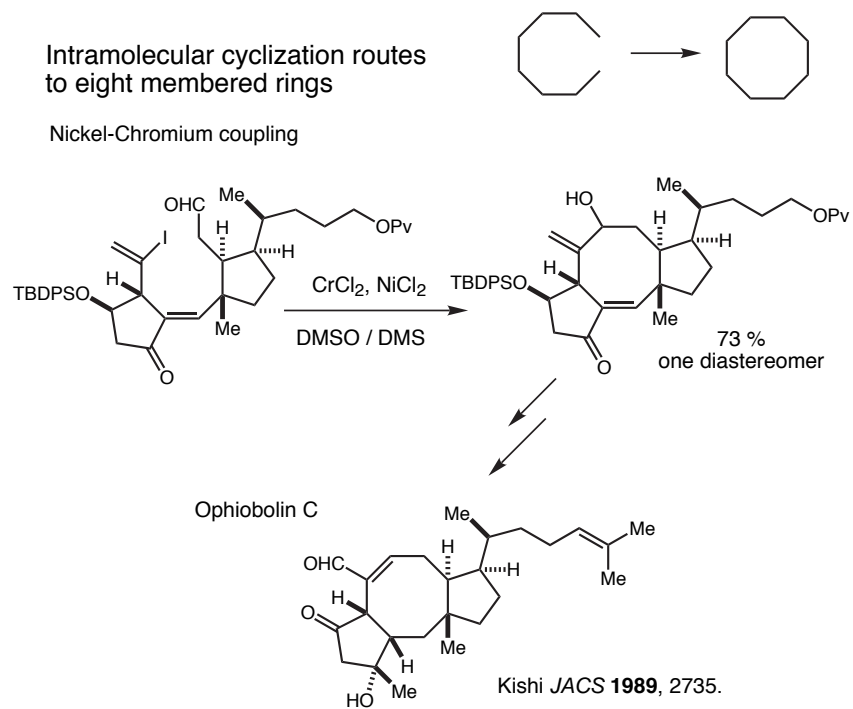


Biaryl coupling:

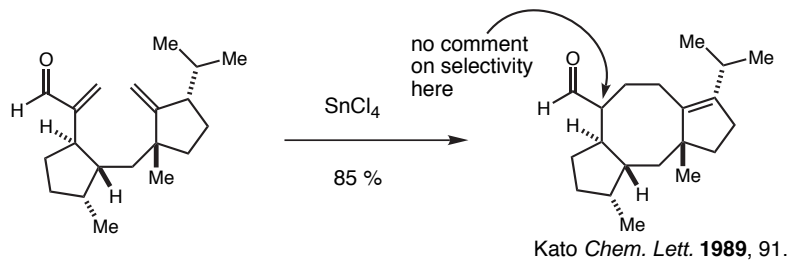


Intramolecular cyclization routes
to eight membered rings

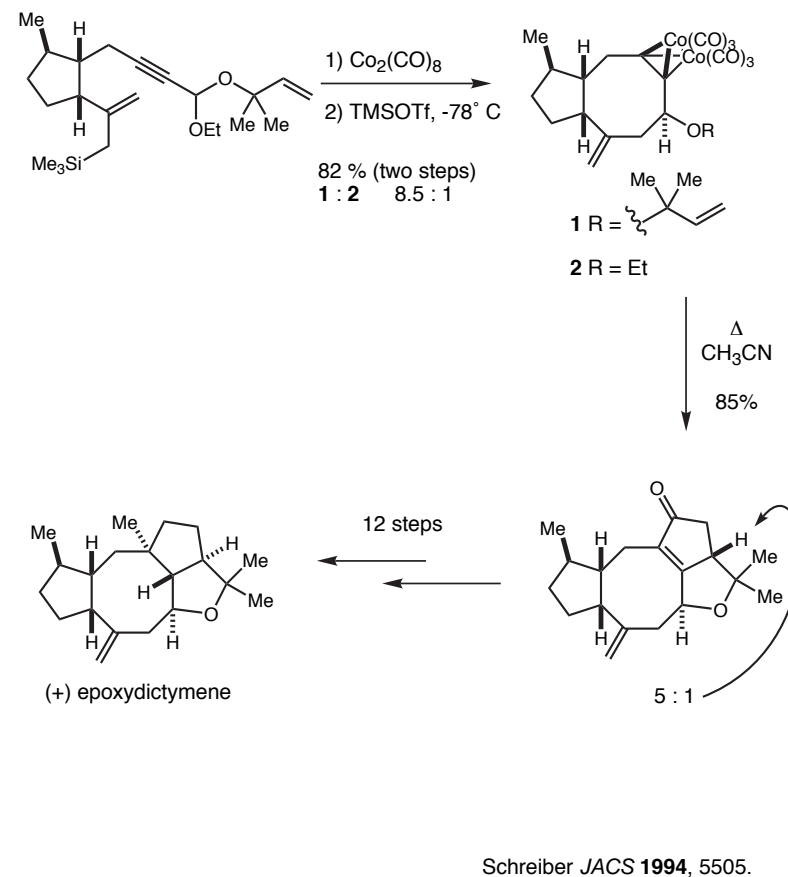
Nickel-Chromium coupling



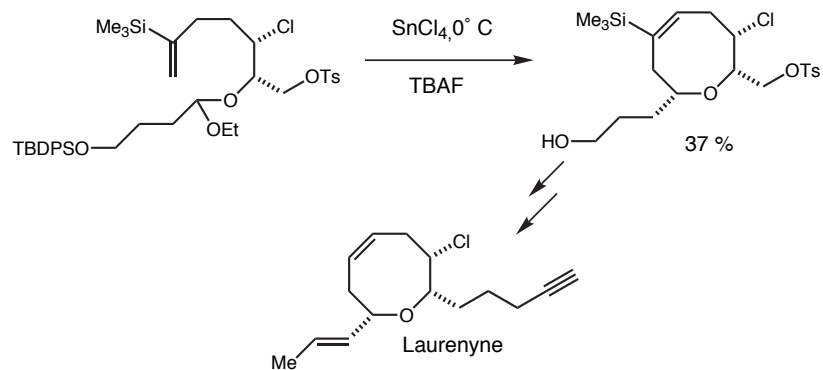
Conjugate ene rxn.



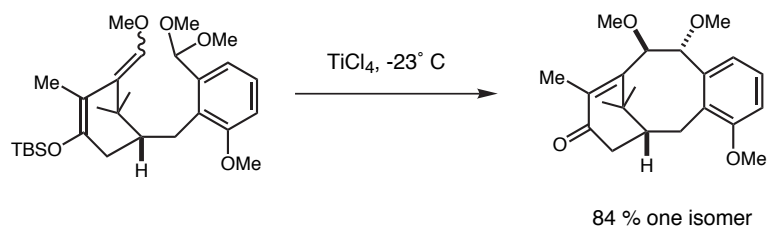
Intramolecular cyclization routes
to eight membered rings



Intramolecular cyclization routes
to eight membered rings



Overman *JACS* **1988**, 2248.

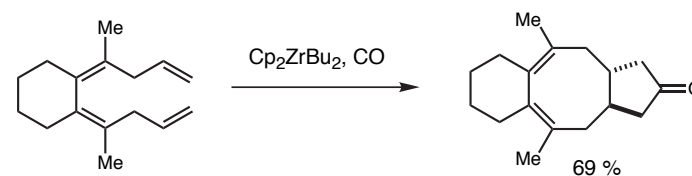


Kuwajima *TL* **1993**, 345.

Intramolecular cyclization routes
to eight membered rings

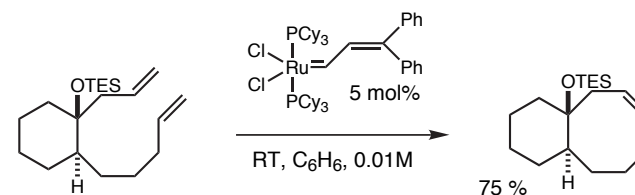


Negishi cyclization



Takahashi *Organomet.* **1994**, 4183.

Ring Closing Metathesis

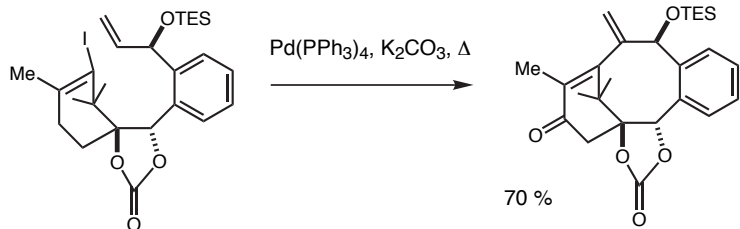


Grubbs *JACS* **1995**, 2108.

Intramolecular cyclization routes to eight membered rings

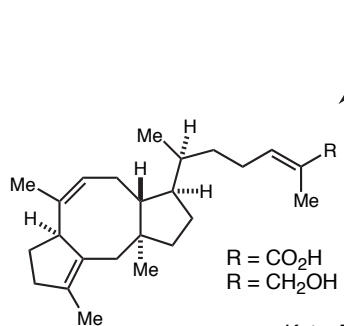
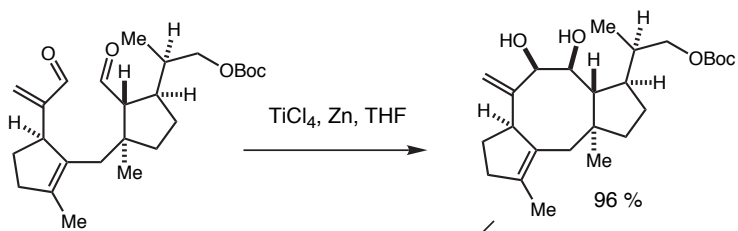


Heck Reaction:



Danishefsky *JACS* **1995**, 5229.

McMurray Rxn.

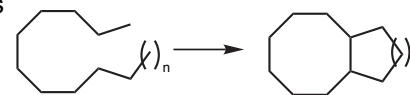


R = CO₂H
R = CH₂OH

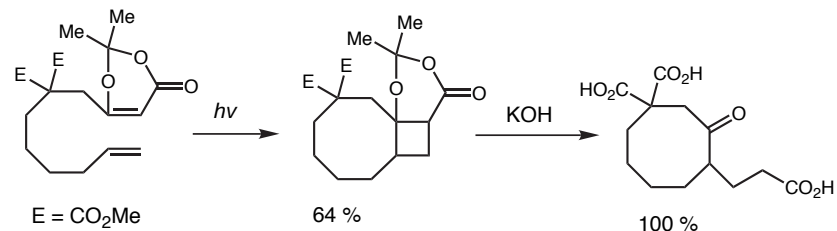
Albolic Acid
Cerroplastol II

Kato, Takeshita *JCSCC* **1988**, 354.

Intramolecular cycloaddition routes to eight membered rings



[2+2]



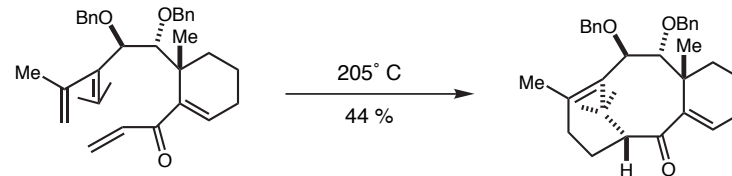
E = CO₂Me

64 %

100 %

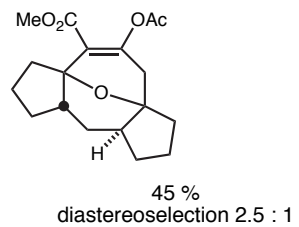
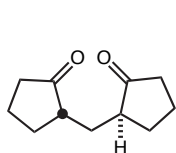
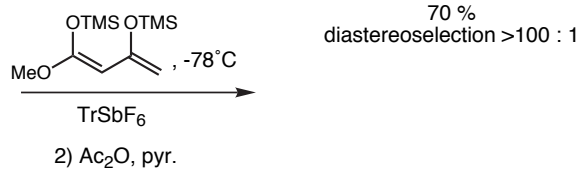
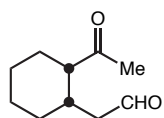
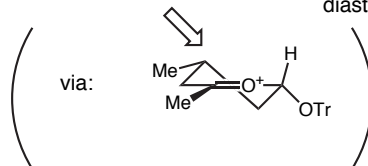
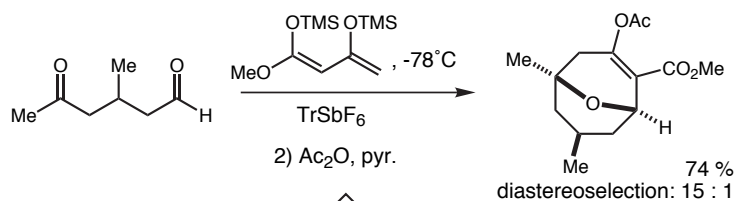
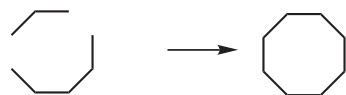
Winkler *Heterocycles* **1987**, 55.

[4+2]



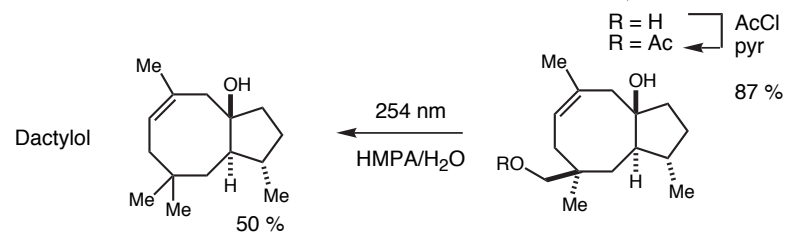
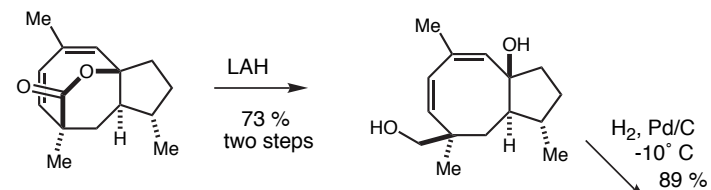
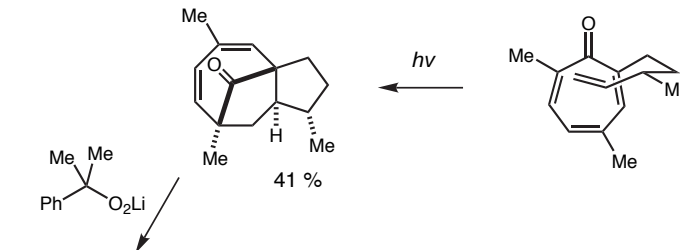
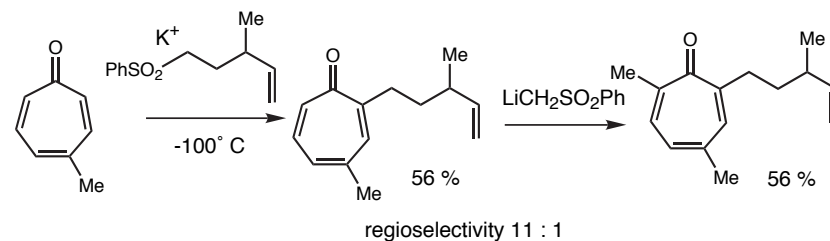
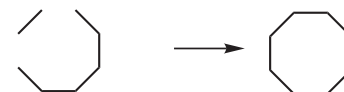
Shea *TL* **1994**, 1317.

"[3 + 5]" Annulation routes
to eight membered rings



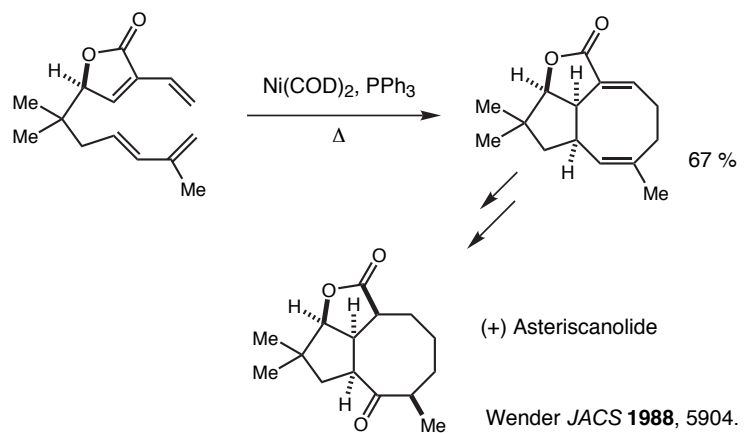
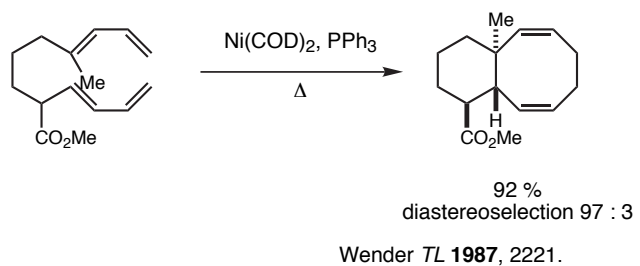
Molander *JOC* **1993**, 5931.

"[2 + 6]" Cycloaddition routes
to Dactyol

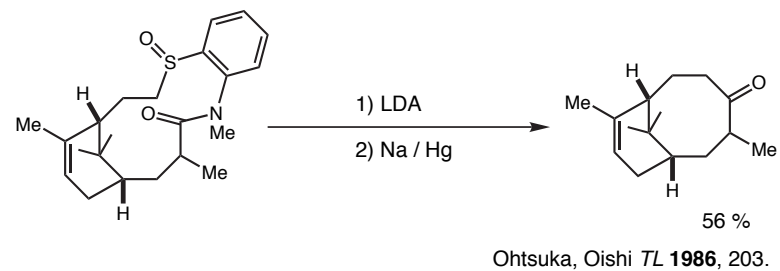


Feldman *JACS* **1989**, 6457.

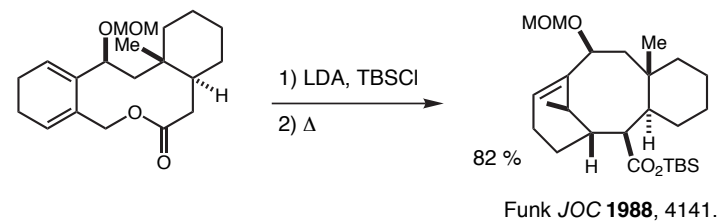
[4 + 4] Cycloaddition routes to eight membered rings



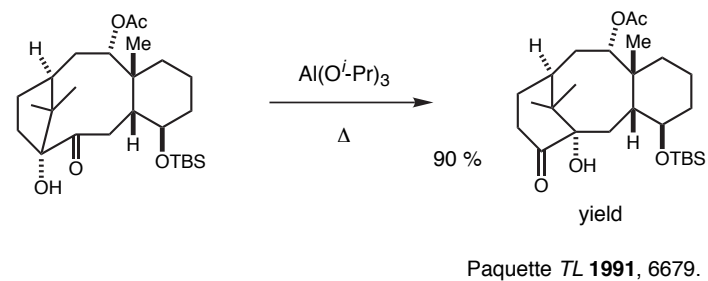
Ring contraction routes to eight membered rings



Ireland-Claisen

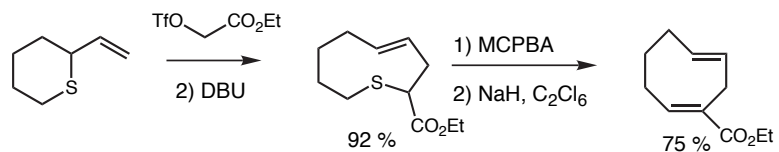


Pinacol



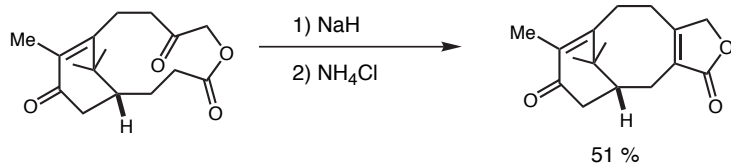
Ring contraction routes to eight membered rings

Ramberg-Backlund



Vedejs *JOC* **1978**, 4884.

Transannular Aldol



Sampson *JOC* **1993**, 6807.

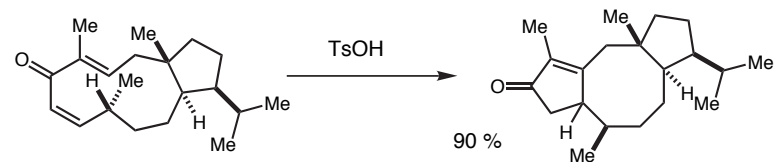
Norrish Type II



Sauers *TL* **1990**, 5709.

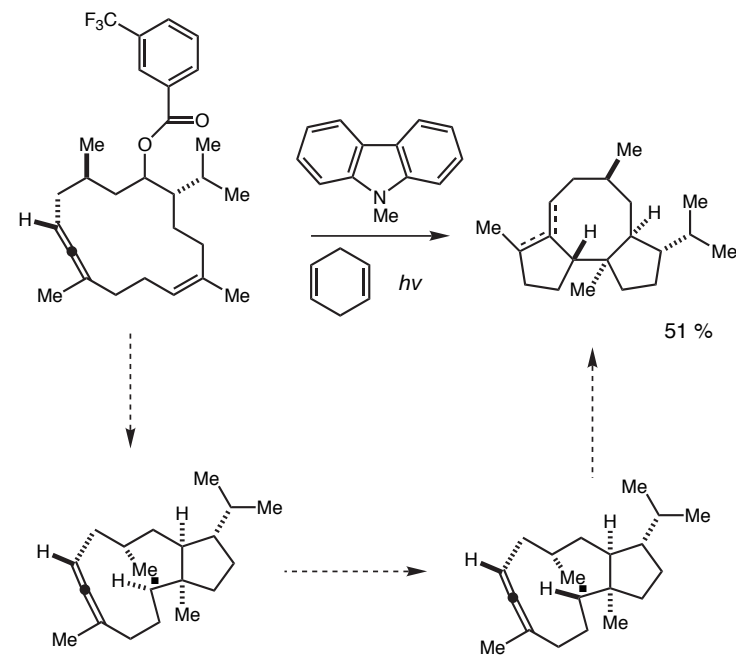
Ring contraction routes to eight membered rings

Transannular Nazarov Cyclization



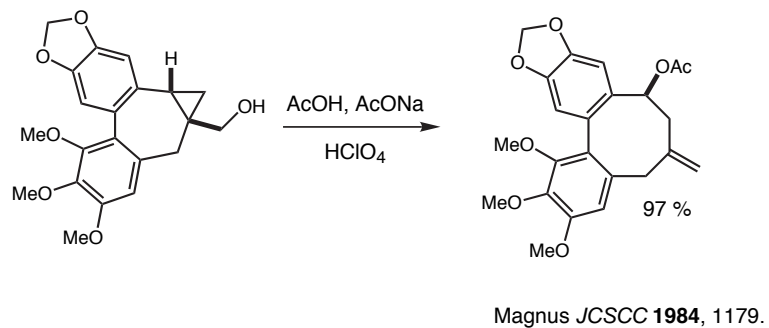
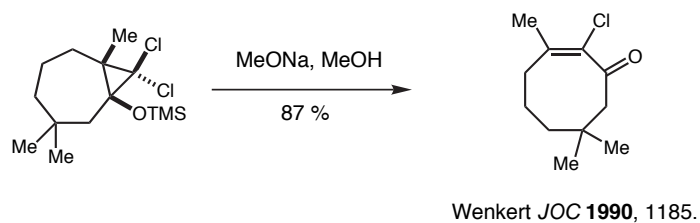
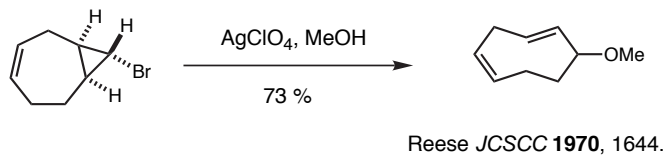
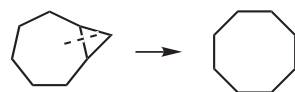
Williams *PJ Coleman Evening Seminar* 10/4/1994

Transannular radical cyclization

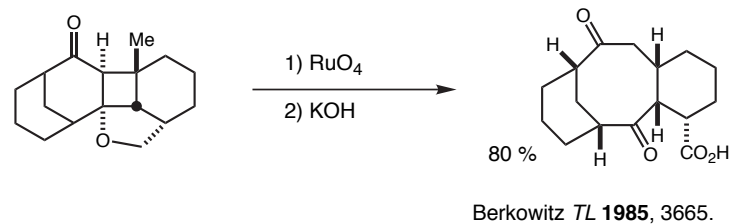
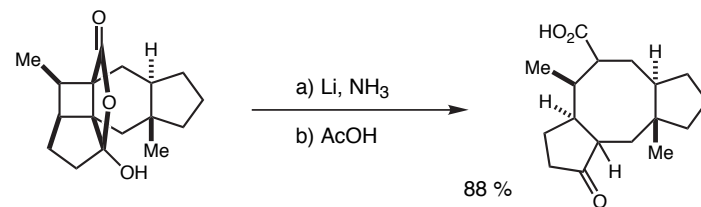
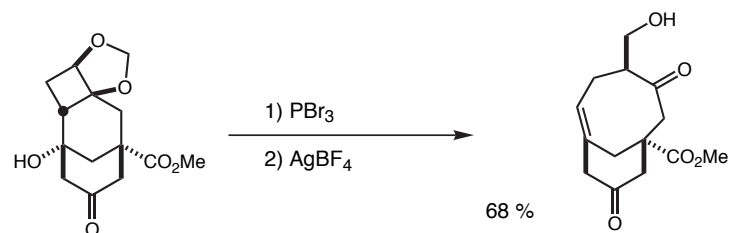
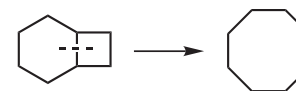


Myers *JACS* **1993**, 7926.

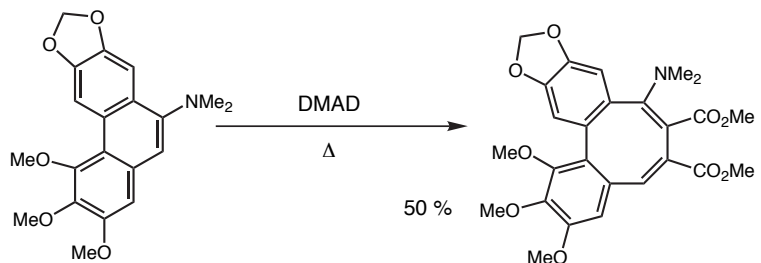
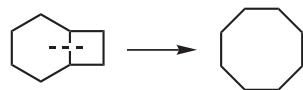
Fragmentation of bicyclic ring systems



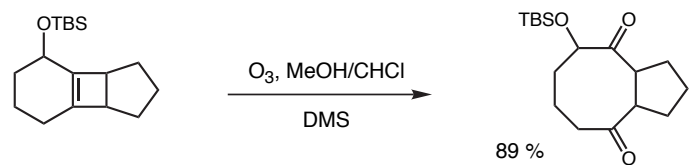
Fragmentation of bicyclic ring systems



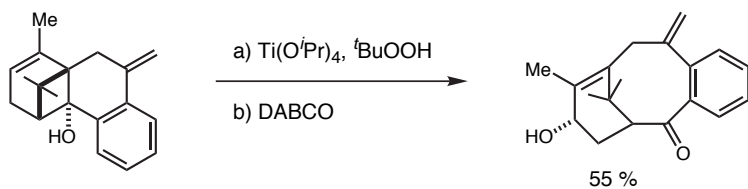
Fragmentation of bicyclic ring systems



Krow *JOC* **1978**, 3950.

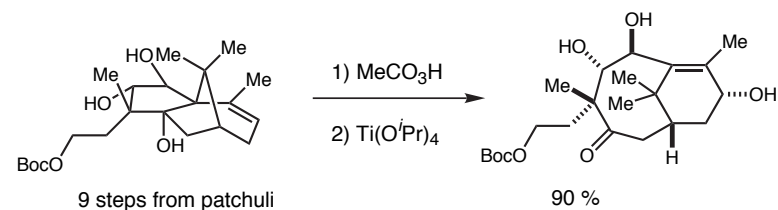
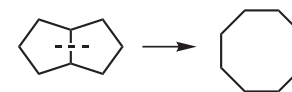


Galatsis *Tetrahed.* **1995**, 665.



Wender *JACS* **1992**, 5878.

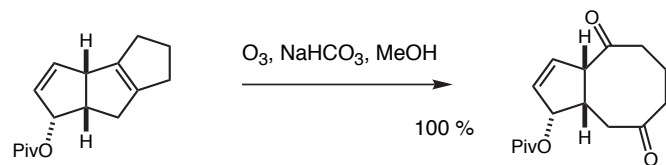
Fragmentation of bicyclic ring systems



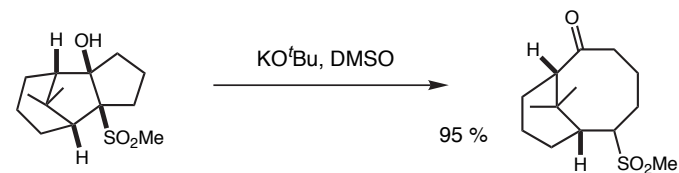
9 steps from patchuli

90 %

Holton *JACS* **1988**, 6558.

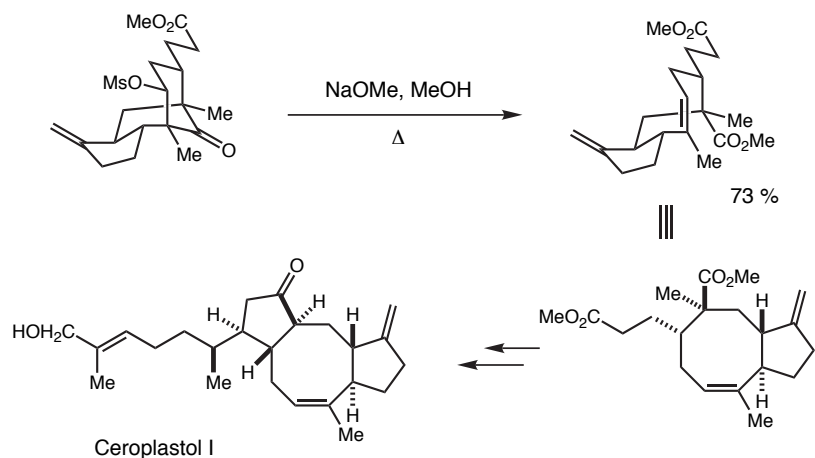
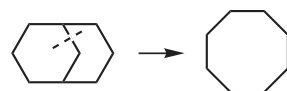


Trost *JOC* **1994**, 7568.

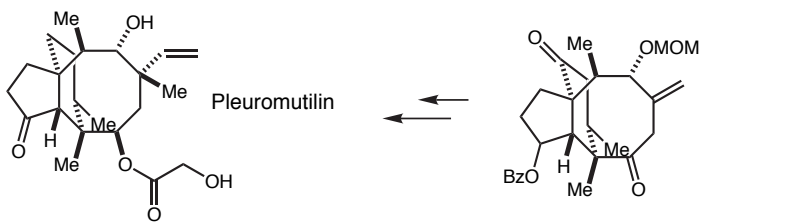
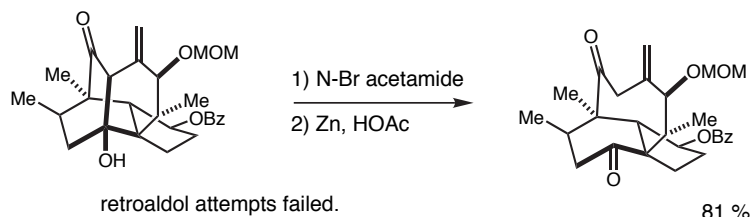


Trost *JACS* **1982**, 886.

Fragmentation of bicyclic ring systems

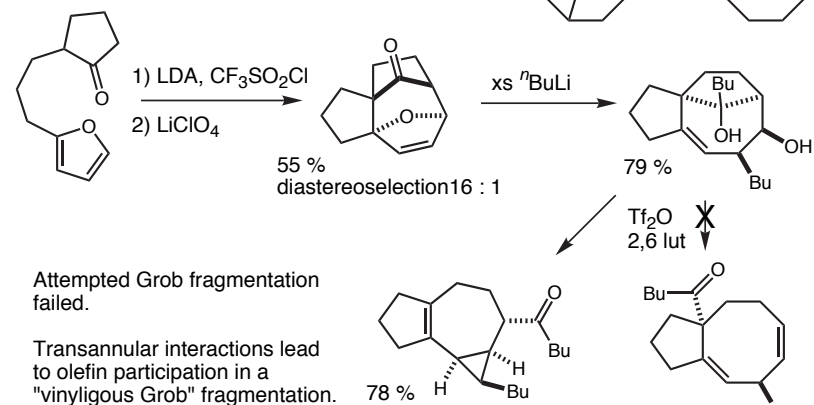
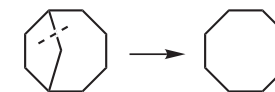


Boeckman *JACS* **1989**, 2737.

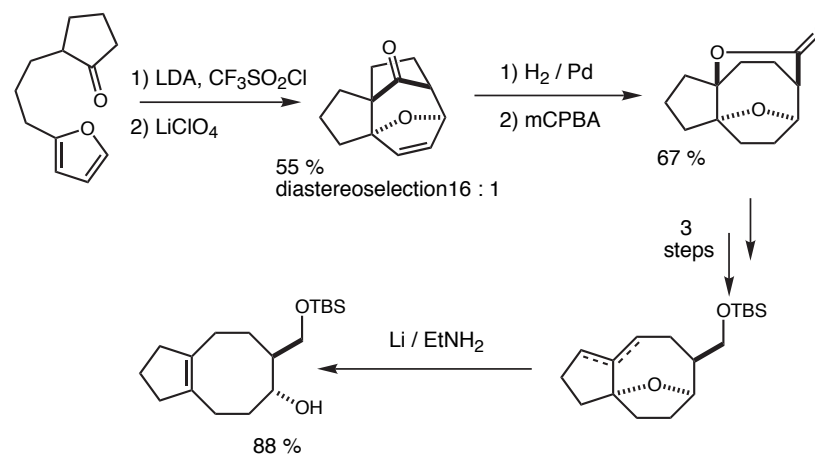


Gibbons, *JACS* **1982**, 1767

Fragmentation of bicyclic ring systems

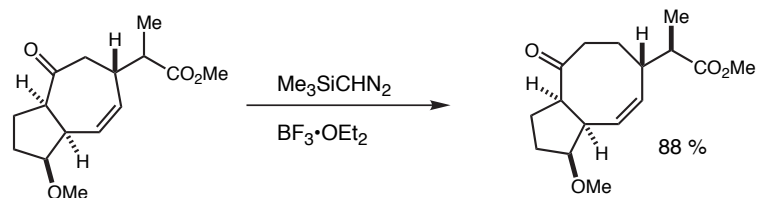
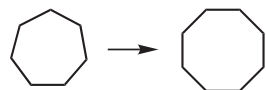


Harmata *TL* **1993**, 789.

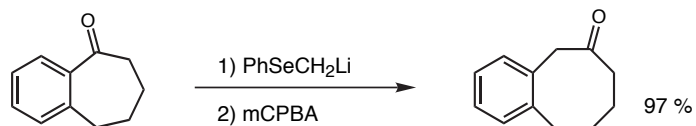


Harmata *JOC* **1994**, 1241.

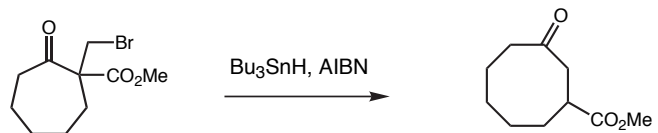
Ring Expansions



Rigby *JOC* **1987**, 4634.



Uemura *JCSCC* **1988**, 111.



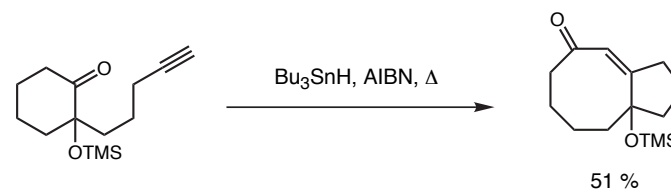
Dowd *JACS* **1987**, 3493.

ene / pinacol

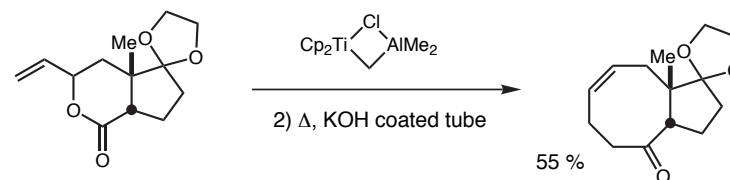


Overman *JACS* **1989**, 1514.

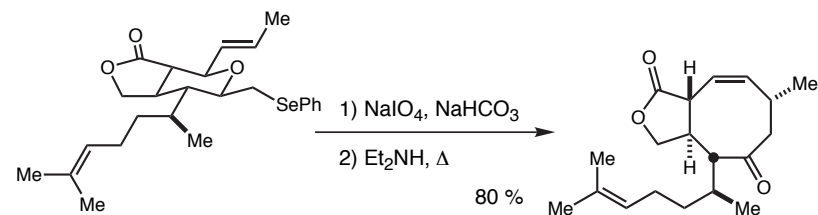
Ring Expansions



Nishida *JACS* **1990**, 902.

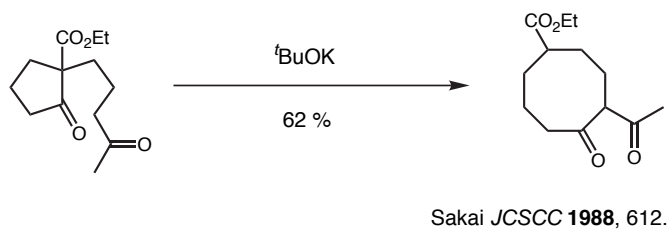
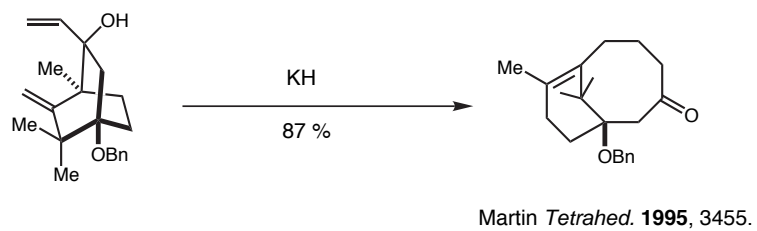
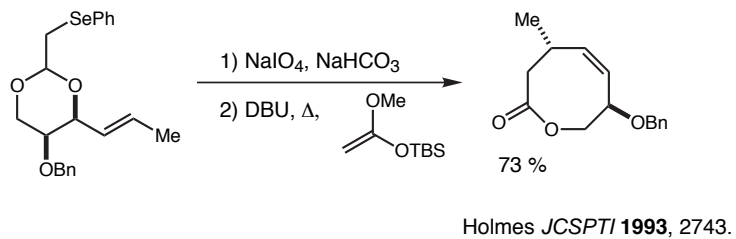
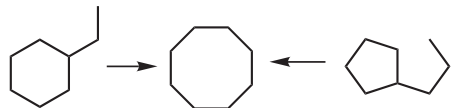


Paquette *JACS* **1993**, 1676.



Paquette *Helv. Chim. Acta* **1995**, 391.

Ring Expansions



Ring Expansions

