

Dendrobine

Isolated from *Dendrobium nobile* L. in 1932 by Suzuki  
Structure elucidated by three groups in 1964  
Component of traditional Chinese medicine "Chin-Shih-Hu"  
Exhibits antipyretic, hypotensive, and convulsant activity  
Possesses seven contiguous stereocenters and four rings

## List of Syntheses:

Yamada et. al. *JACS*, **94**, 23, 8278-8280. 1972.

Inubushi et al. *Chem. Pharm. Bull.* **22**, 2, 349-367. 1972.

Kende et. al. *JACS*, **96**, 13, 4332-4334, 1974.

Roush, W. R. *JACS*, **102**, 4, 1390-1404. 1980<sup>□</sup>

Martinand Li. *JOC*, **56**, 2, 642-650. 1991.

Trost et. al. *JACS*, **113**, 2, 670-672, 1991. (□), (F)

Livinghouse et. al. *JACS*, **114**, 11, 4089-4095, 1992.

Mori et. al. *JOC*, **59**, 19, 5633-5642, 1994 (F)<sup>□</sup>

Sha et. al. *JACS*, **119**, 18, 4130-4135. 1997 (□)

Cassayre and Zard. *JACS*, **121**, 25, 6072-6073, 1999 (□)<sup>□</sup>

Padwa et. al. *OL*, **2**, 20, 3233-3235, 2000. (F)

□ Indicates multiple publications on the synthesis exist.

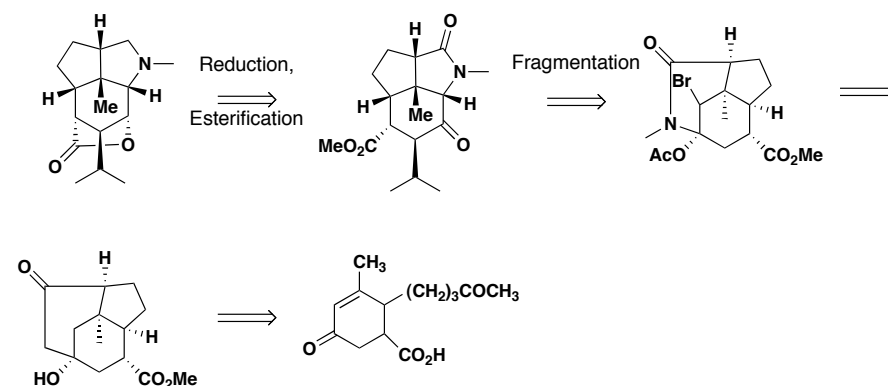
The listed publication is the most recent.

(F) Indicates a formal synthesis.

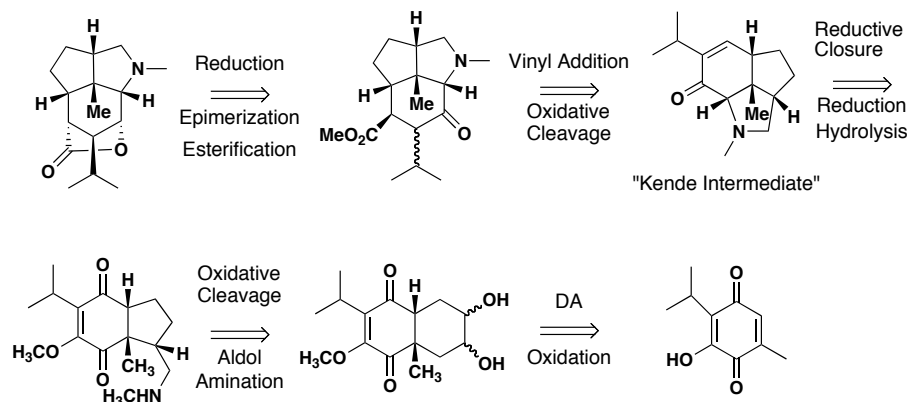
(□) Indicates that optically active dendrobine was synthesized.

## Retrosynthetic Analysis

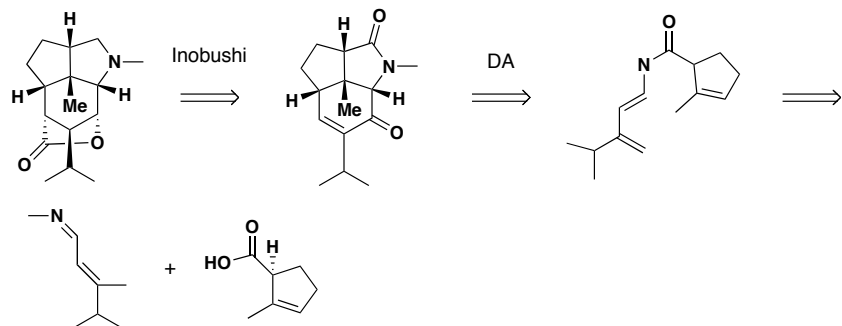
Yamada et. al.



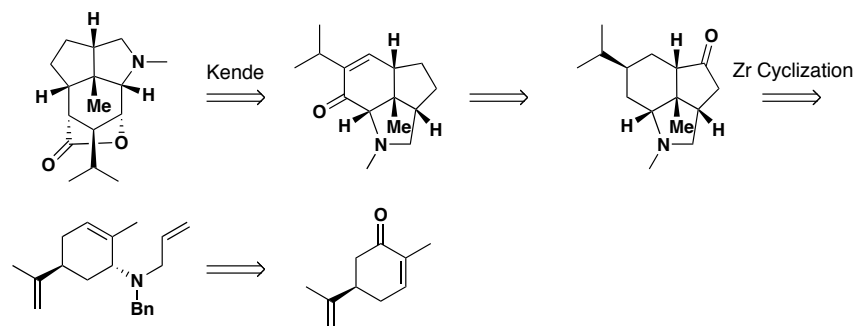
Kende et. al.



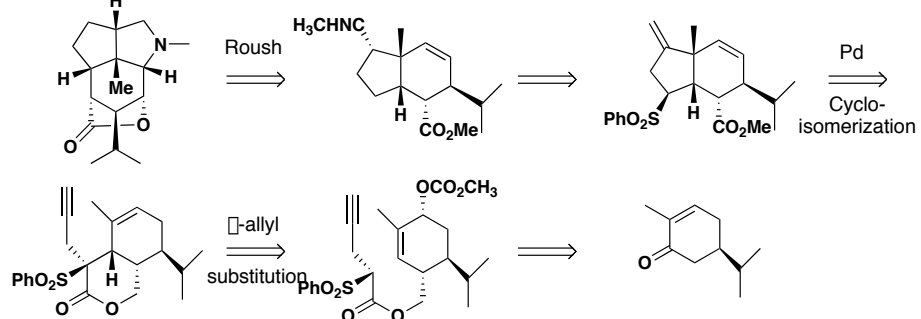
Martin and LI



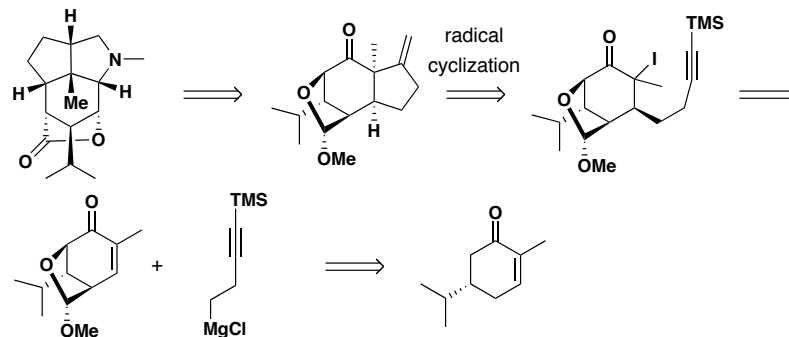
Mori et. al.



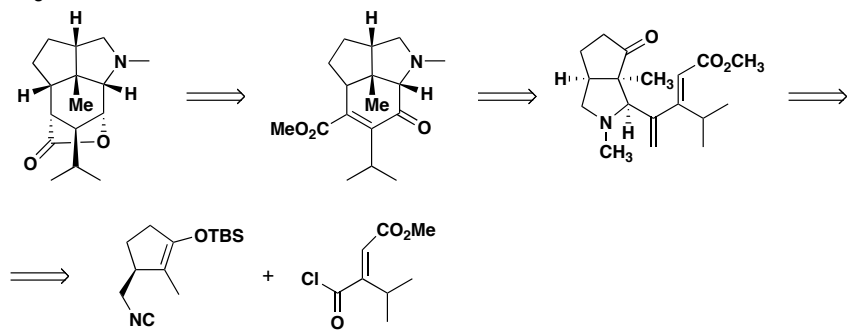
Trost et. al.



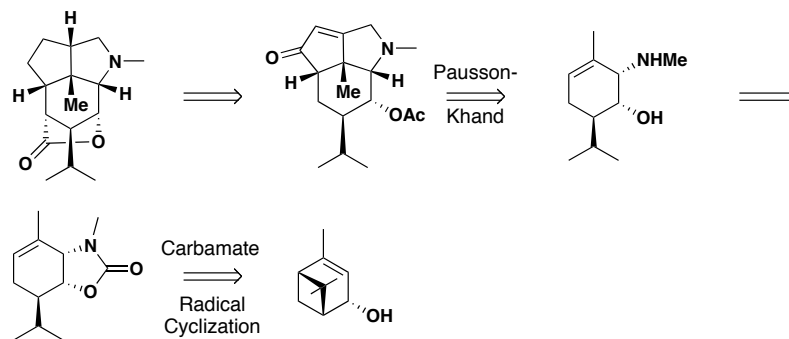
Sha et. al.



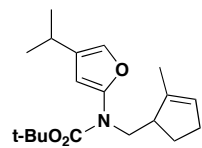
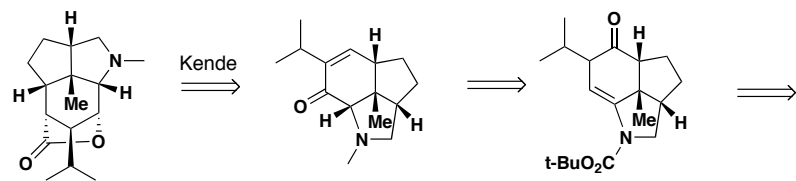
Livinghouse et. al.

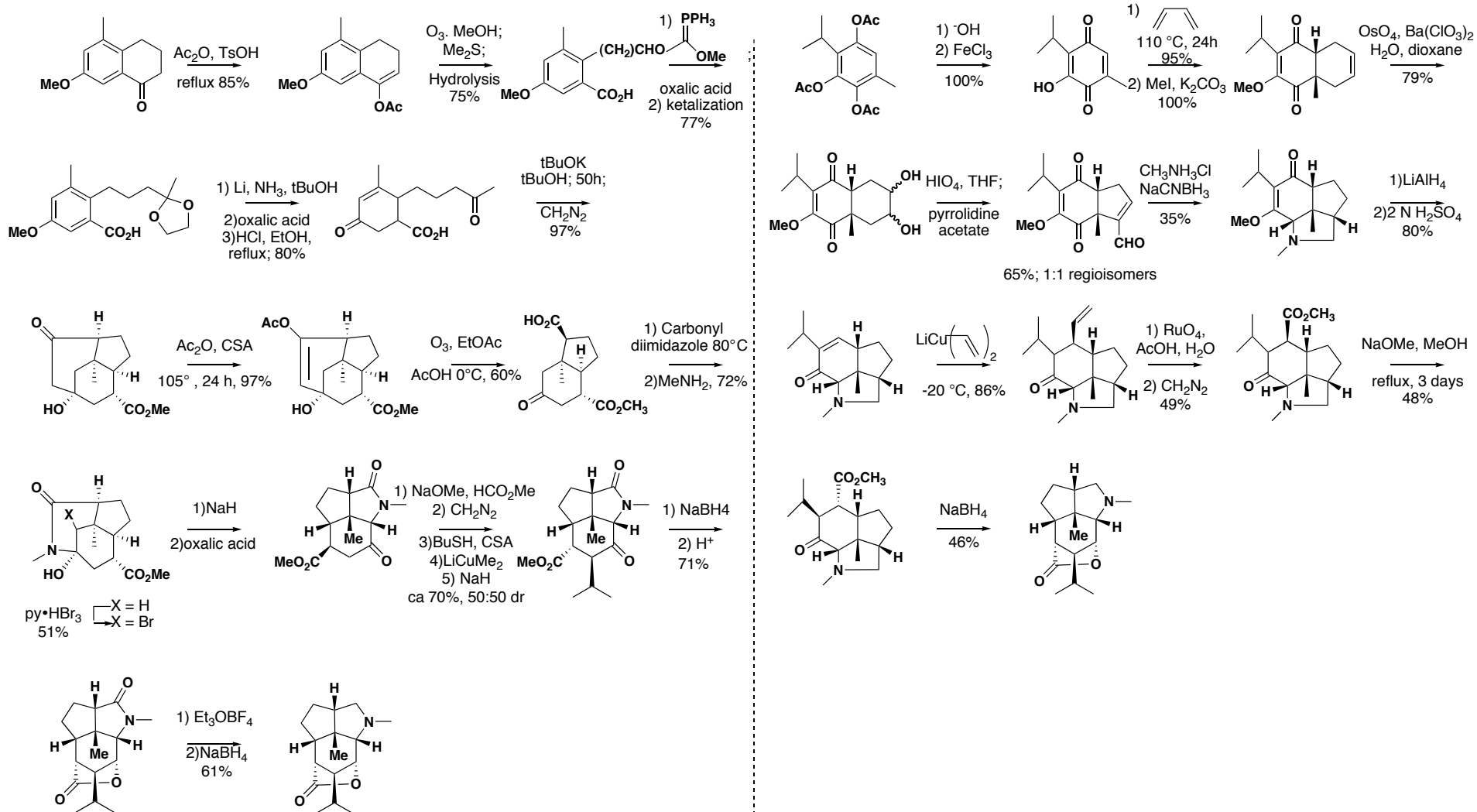


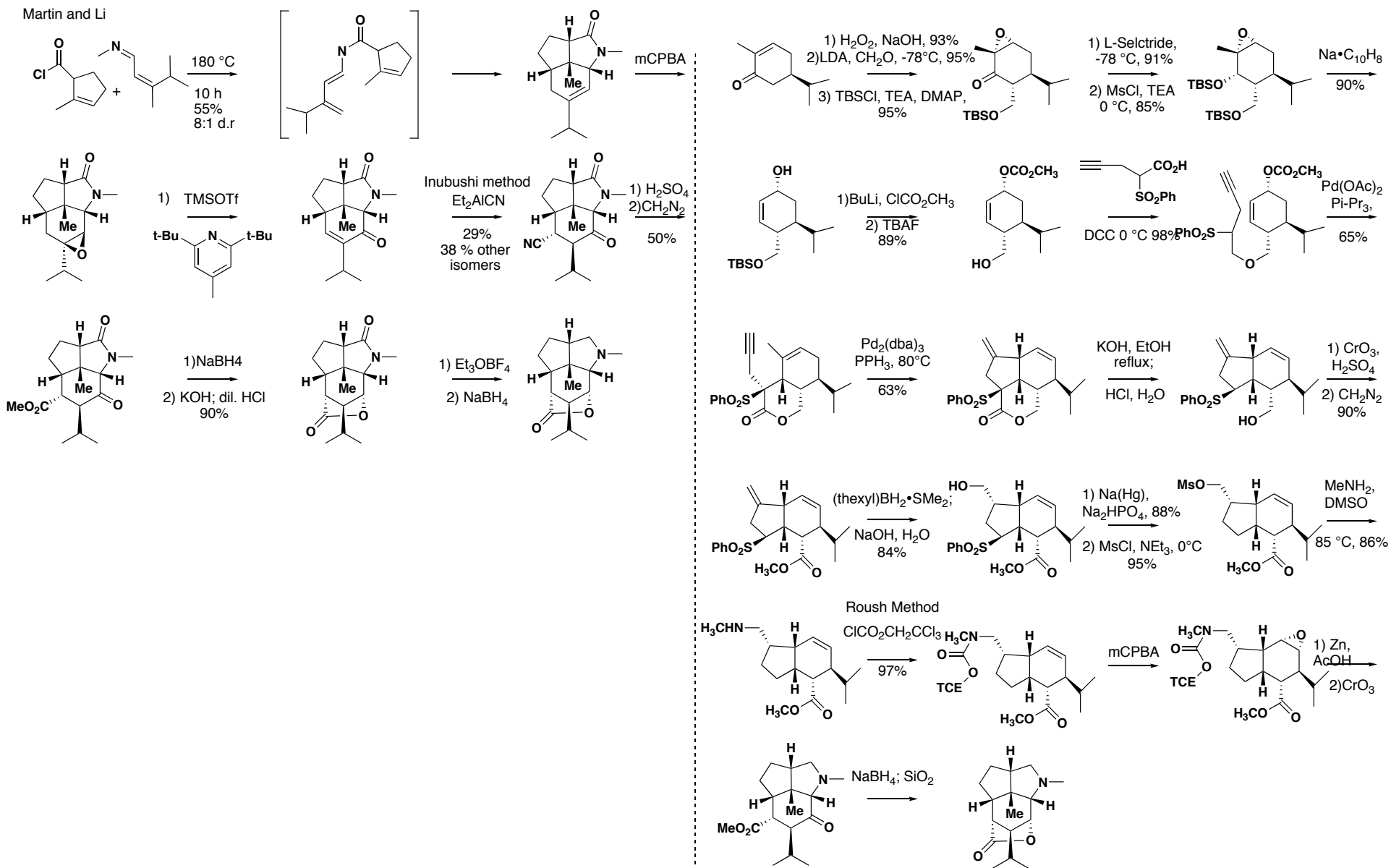
Cassayre and Zard



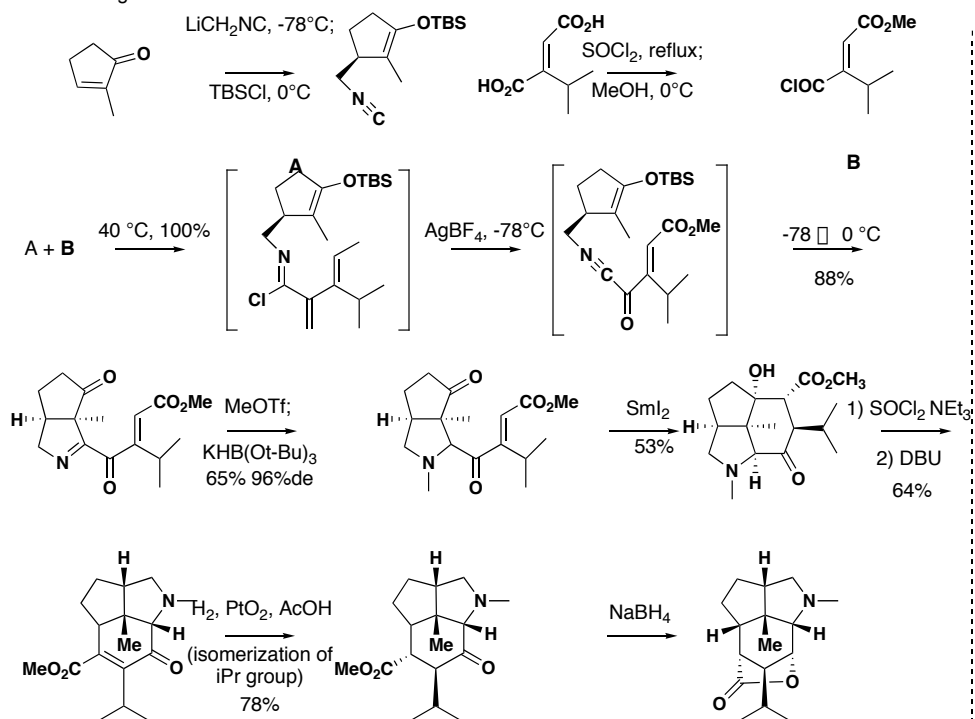
Padwa et. al.



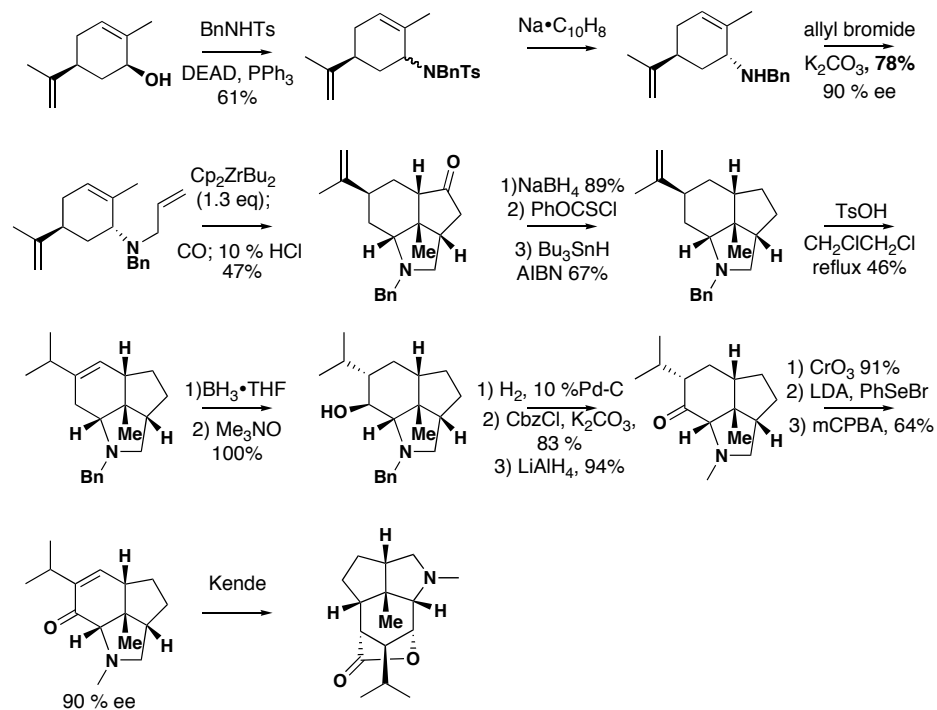




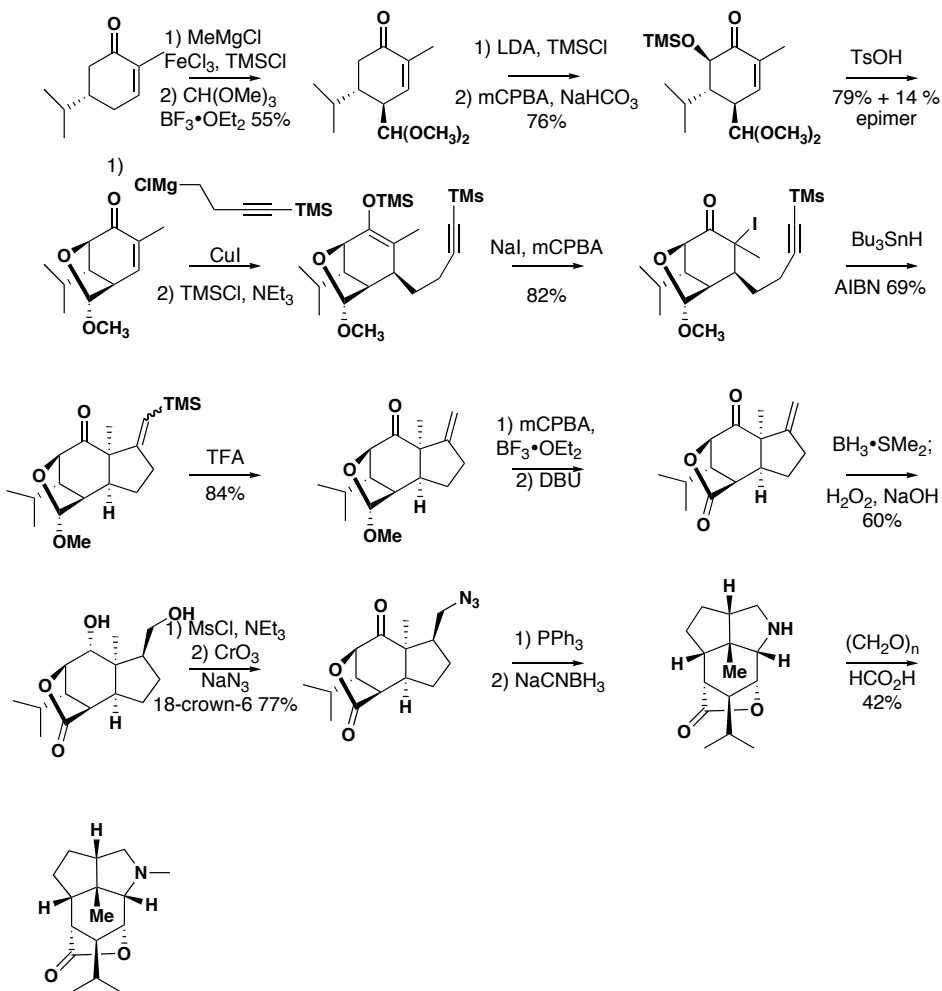
Livinghouse et. al.



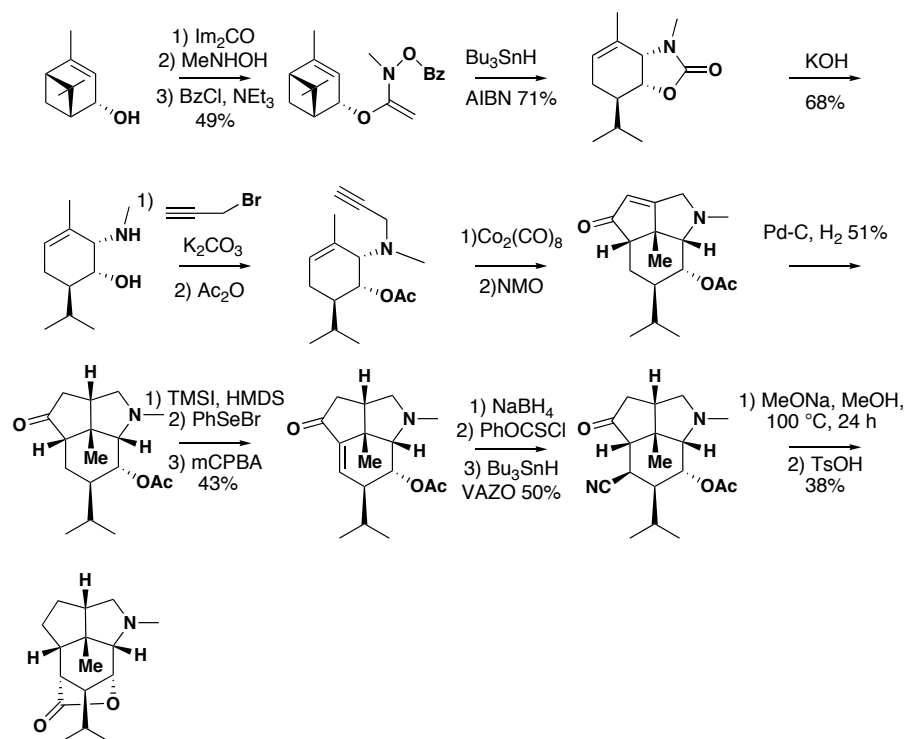
Mori et. al.



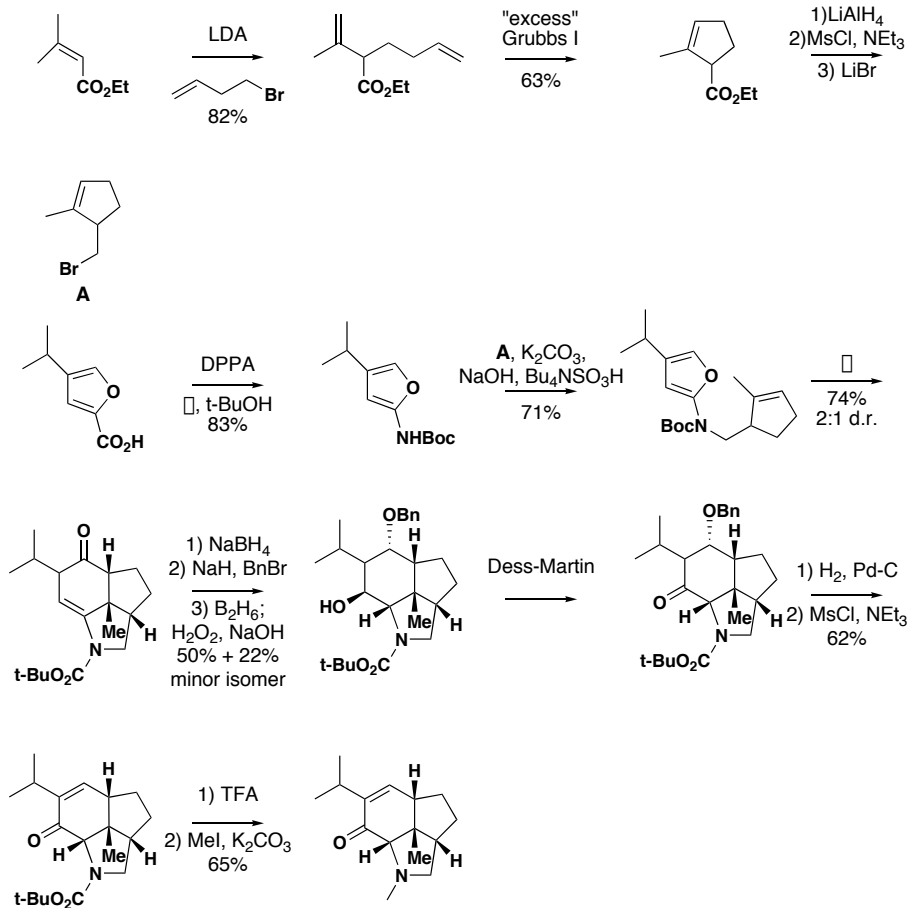
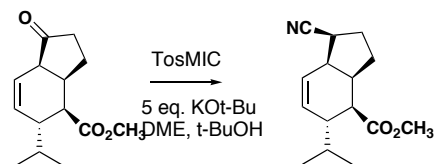
Sha et. al.



Cassary and Zard



Padwa et. al.


 Mechanism fun from Roush synthesis:  
 van Leusen et. al. *JOC*, 42, 19, 3114-3118, 1977




## *The Final Tally*

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	<i>Longest Linear Sequence</i>	<i>Overall Yield</i>
<i>Racemic Syntheses</i>		
Inubushi	20 steps	0.06%
Martin	14 steps	0.12%
Yamada	24 steps	0.99%
Kende	15 steps	1.1%
Livinghouse	10 steps	6.15%
Roush	24 steps	0.66%
<i>Enantioselective Syntheses</i>		
Trost	26 steps	1.98%
Mori	21 steps	0.78%
Sha	20 steps	2.0%

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Taken from a Evans group presentation; the author takes neither credit nor responsibility for this figures.