

# Hayashi Laboratory

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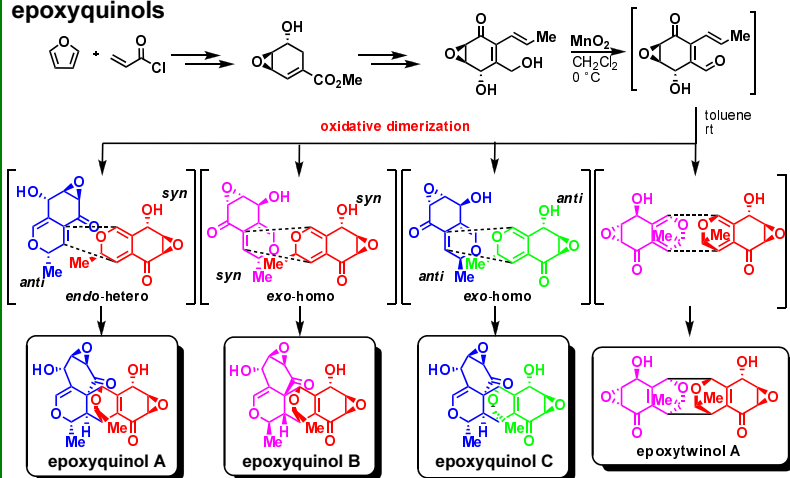
Hayashi Lab. Homepage <http://www.ykbsc.chem.tohoku.ac.jp/>



TOHOKU UNIVERSITY

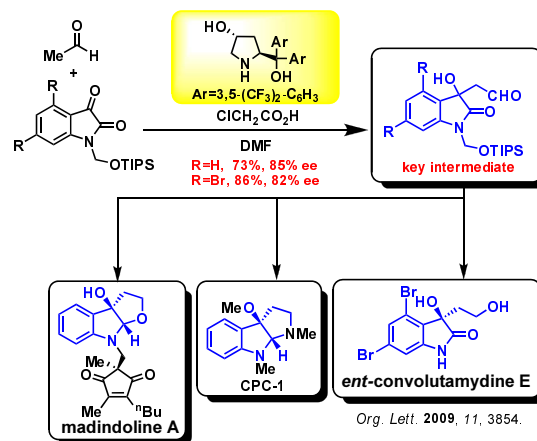
## Total Synthesis of Bioactive Compounds

### epoxyquinols



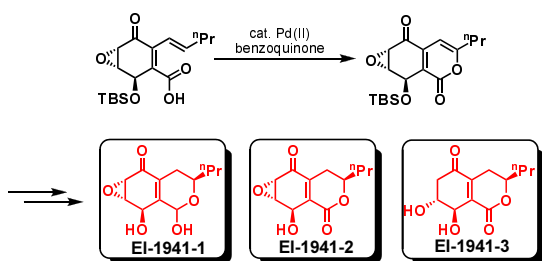
angiogenesis inhibitor  
*Angew. Chem., Int. Ed.*, **41**, 3192 (2002); *Tetrahedron Lett.*, **43**, 9155 (2002);  
*Tetrahedron Lett.*, **44**, 7205 (2003); *J. Org. Chem.*, **69**, 1548 (2004);  
*J. Org. Chem.*, **70**, 79 (2005); *Org. Lett.*, **8**, 1041 (2006).  
 Review; *Eur. J. Org. Chem.*, **23**, 3783 (2007).

### CPC-1, ent-convolutamydine E, and half segment of madindoline A



*Org. Lett.* **2009**, **11**, 3854.

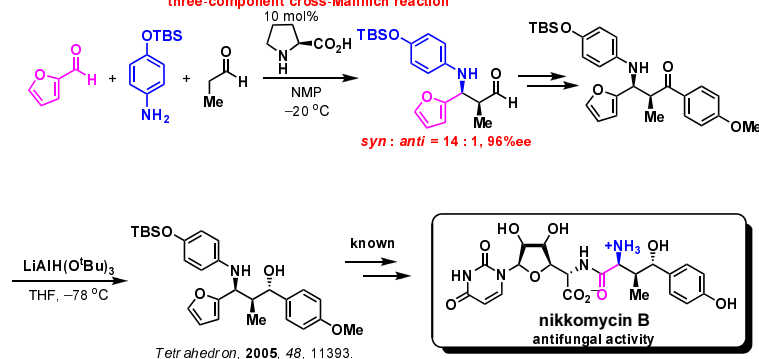
### EI-1941-1, EI-1941-2, EI-1941-3



ICE (interleukin 1- $\beta$  converting enzyme) inhibitor  
*Org. Lett.* **2004**, **6**, 4535.  
*J. Org. Chem.* **2005**, **70**, 9905.

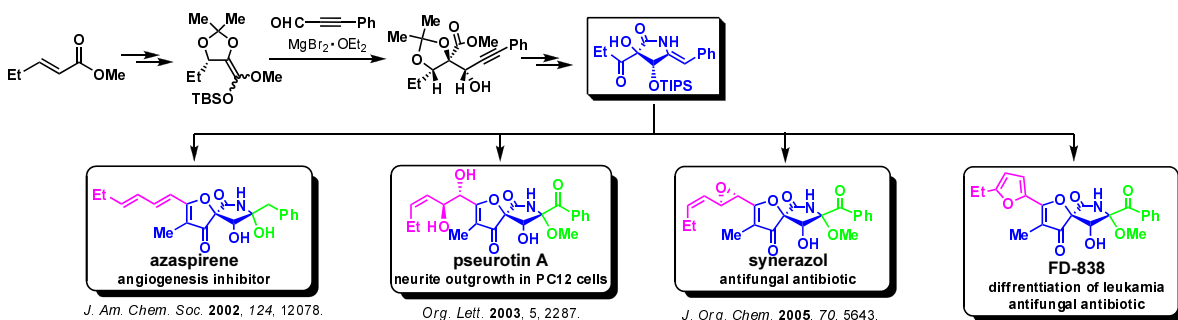
### formal total synthesis of nikkomycin B

three-component cross-Mannich reaction



*Tetrahedron*, **2005**, **48**, 11393.

### azaspirene, pseurotin A, synerazol, FD-838



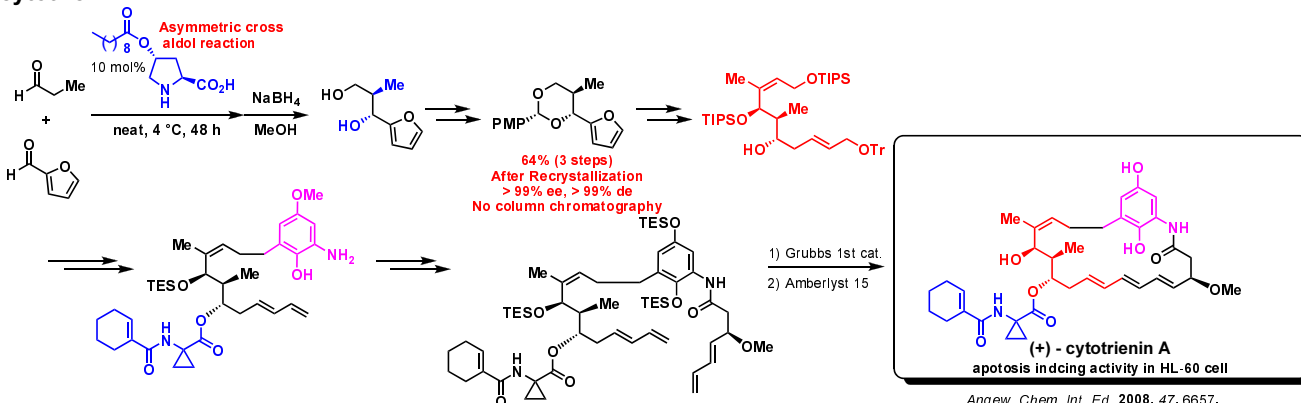
*J. Am. Chem. Soc.* **2002**, **124**, 12078.

*Org. Lett.* **2003**, **5**, 2287.

*J. Org. Chem.* **2005**, **70**, 5643.

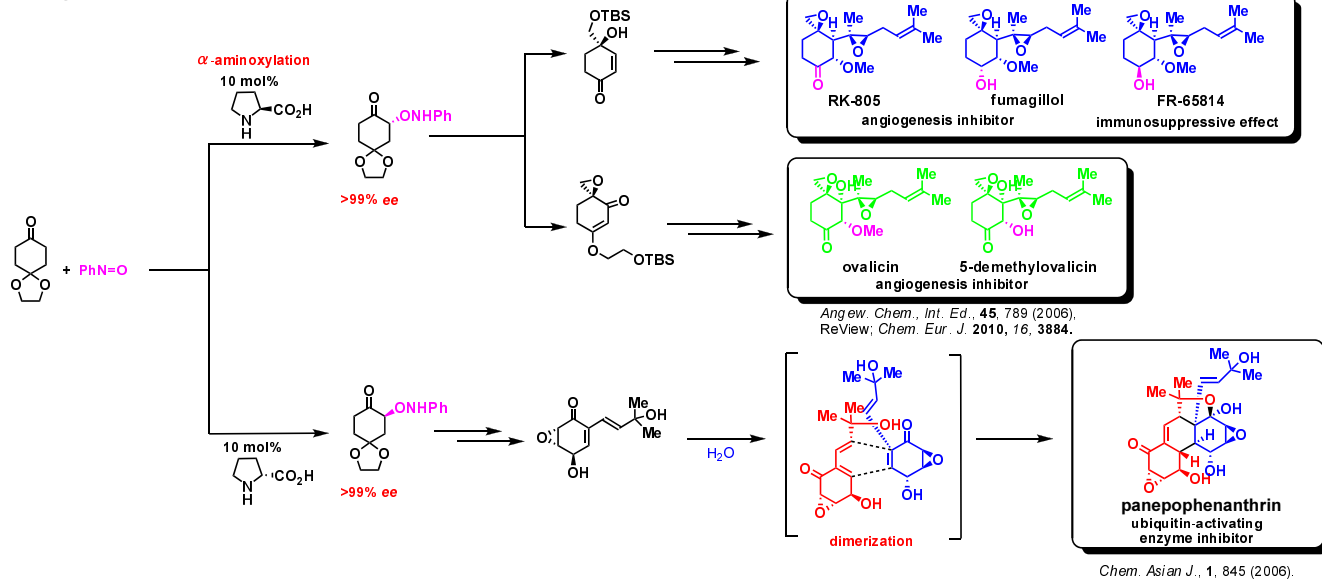
*Bioorg. Med. Chem. Lett.* **2009**, **19**, 3863.

### (+) - cytotrienin A

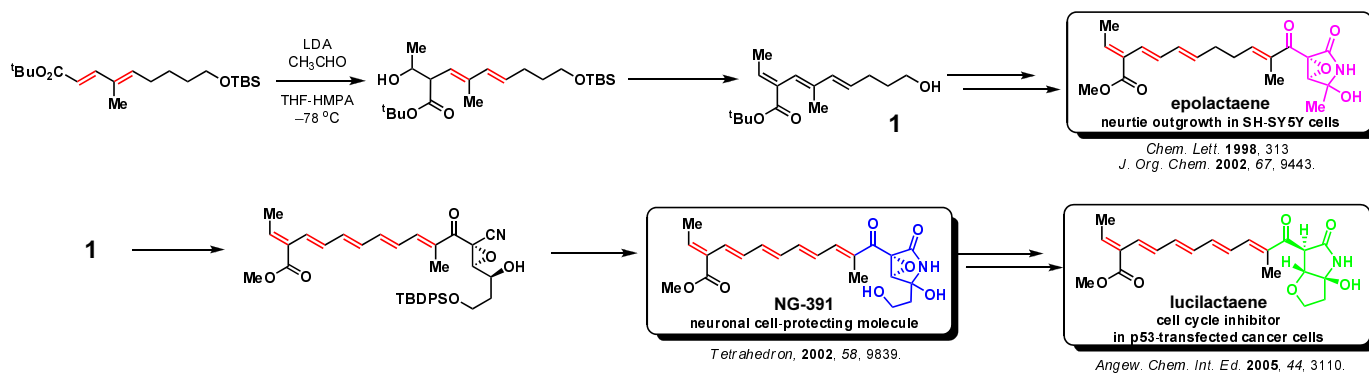


*Angew. Chem., Int. Ed.* **2008**, **47**, 6657.

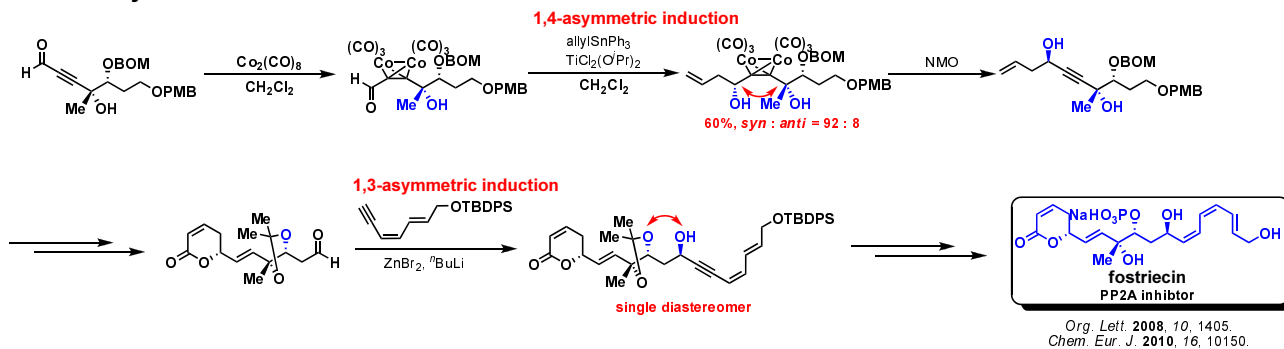
## fumagillins, ovalicins, panepophenanthrin



## epolactaene, NG-391, lucilactaene

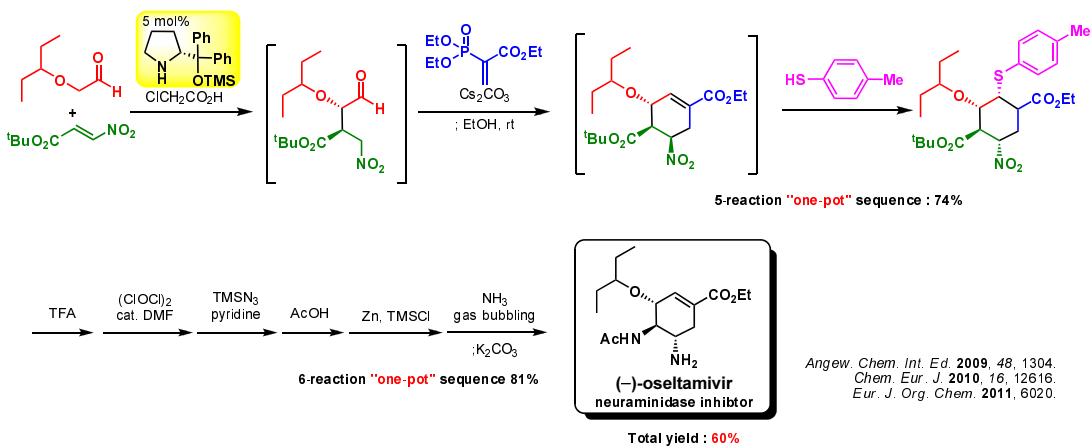


## formal total synthesis of fostriecin



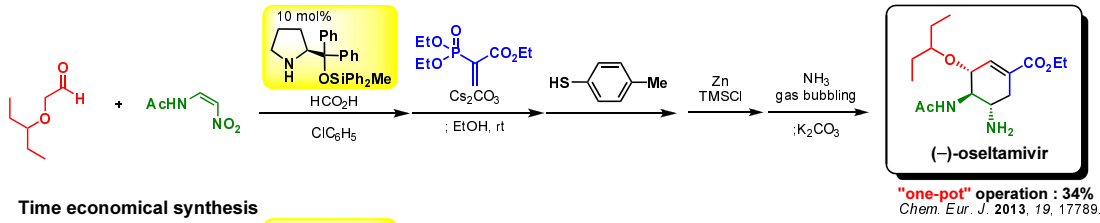
## (-)- oseltamivir (Tamiflu®)

### 1st and 2nd generation

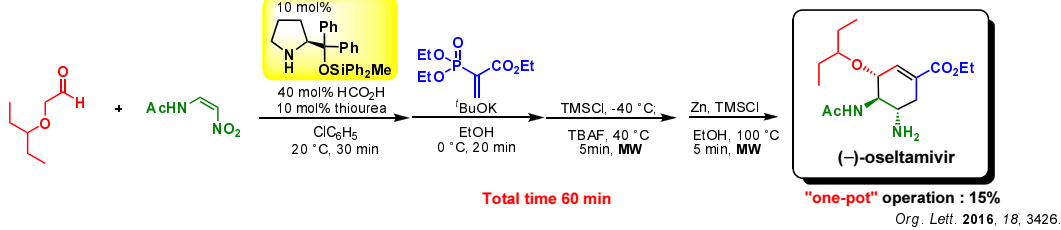


## (-)- oseltamivir (Tamiflu®)

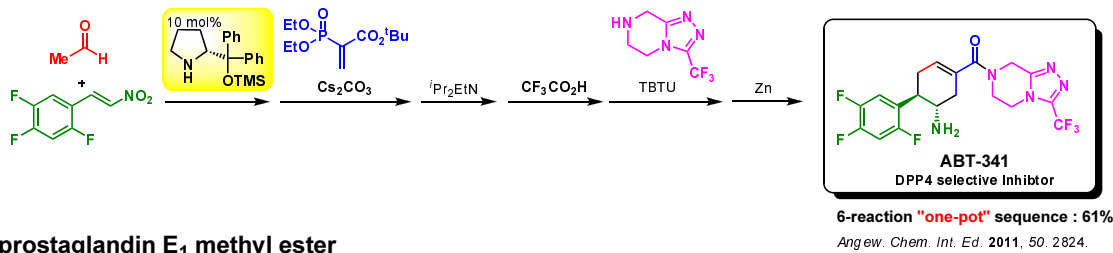
3rd generation



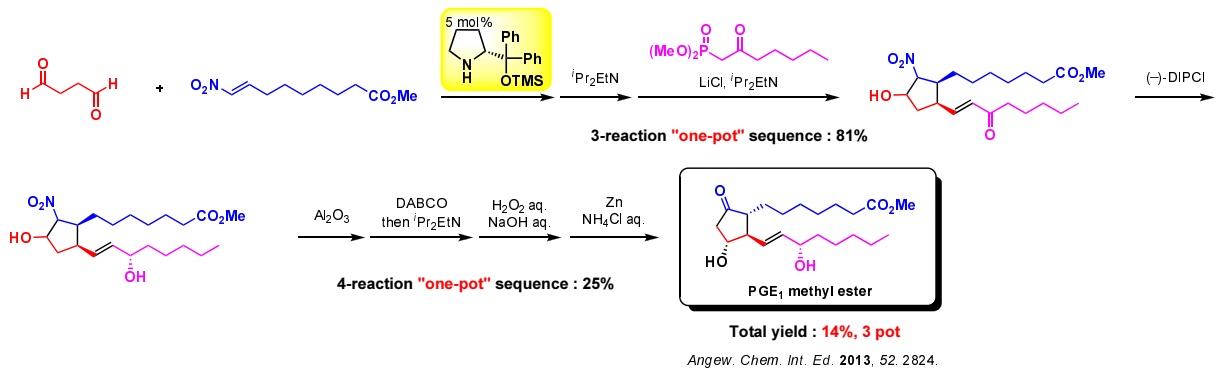
Time economical synthesis



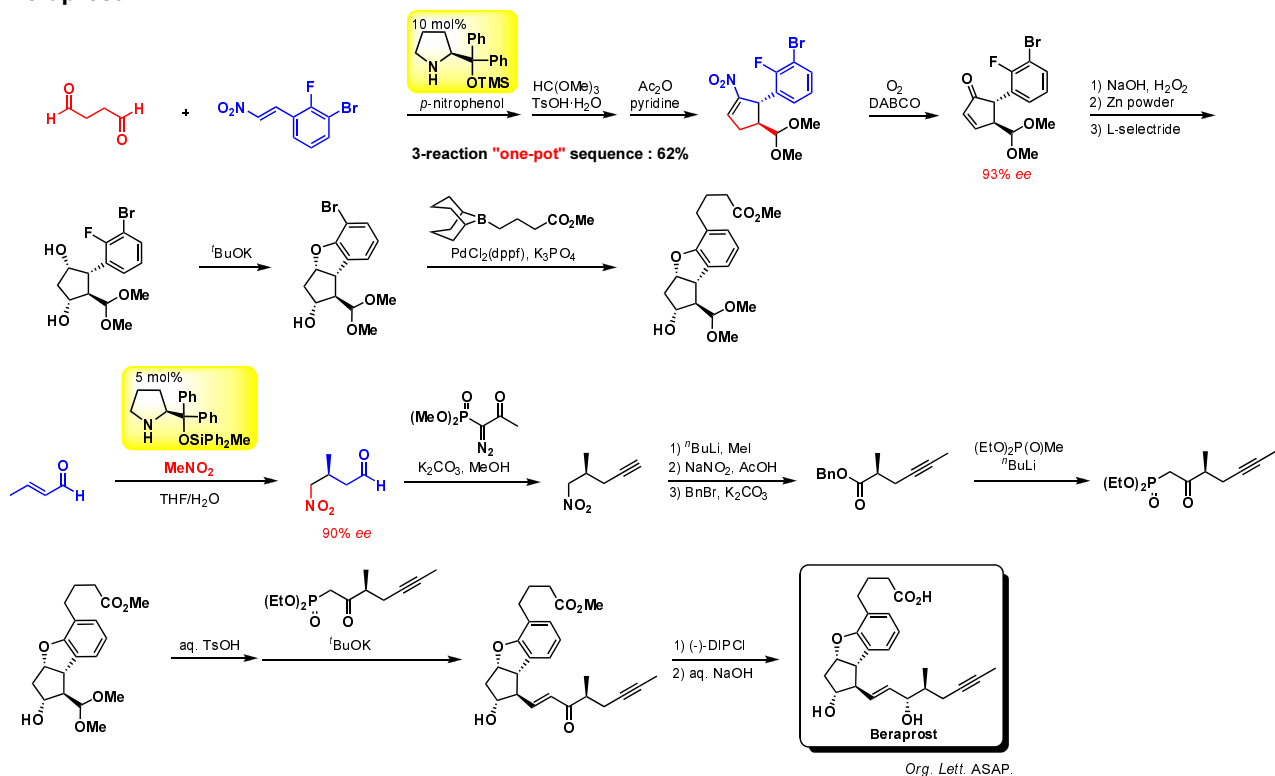
ABT-341



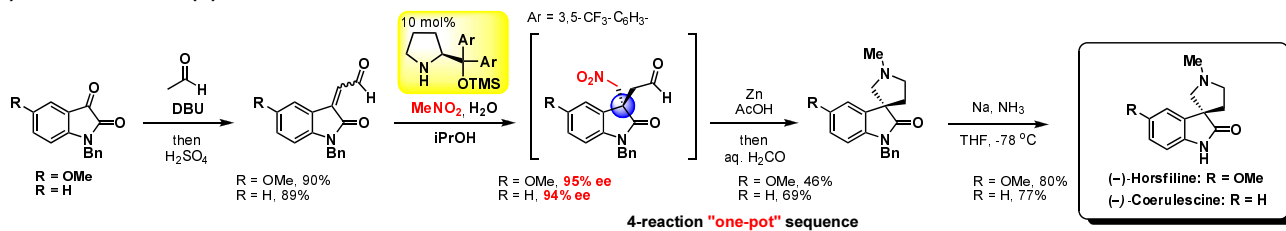
prostaglandin E<sub>1</sub> methyl ester



Beraprost



**(-)-horsfiline and (-)-coerulescine**

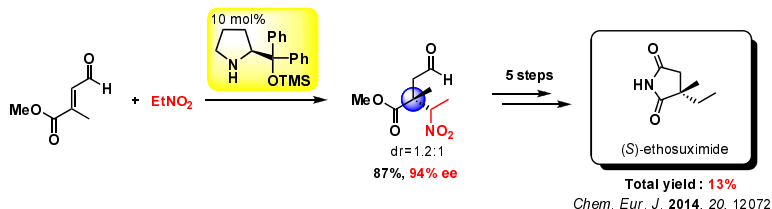


**Three "one-pot" operations**

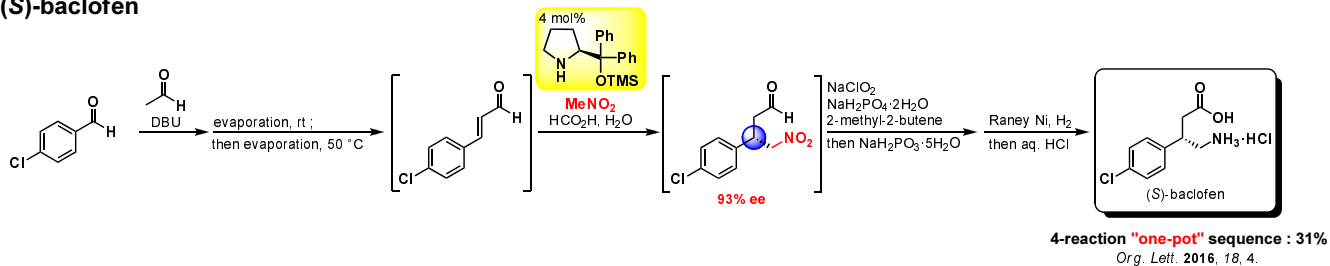
Total yield  
(-)-Horsfiline : 33%  
(-)-Coerulescine : 46%

Chem. Eur. J. 2014, 20, 13583.

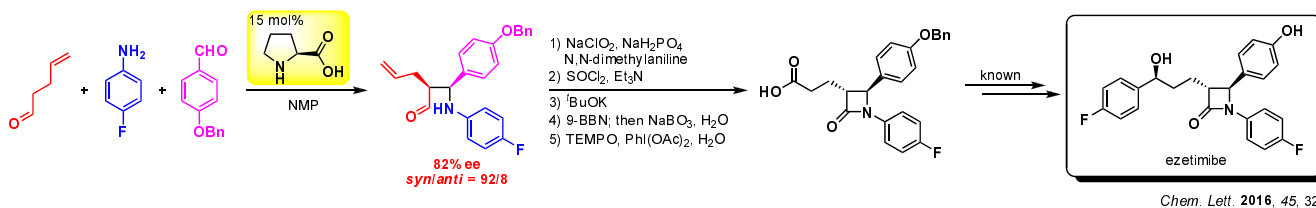
**(S)-ethosuximide**



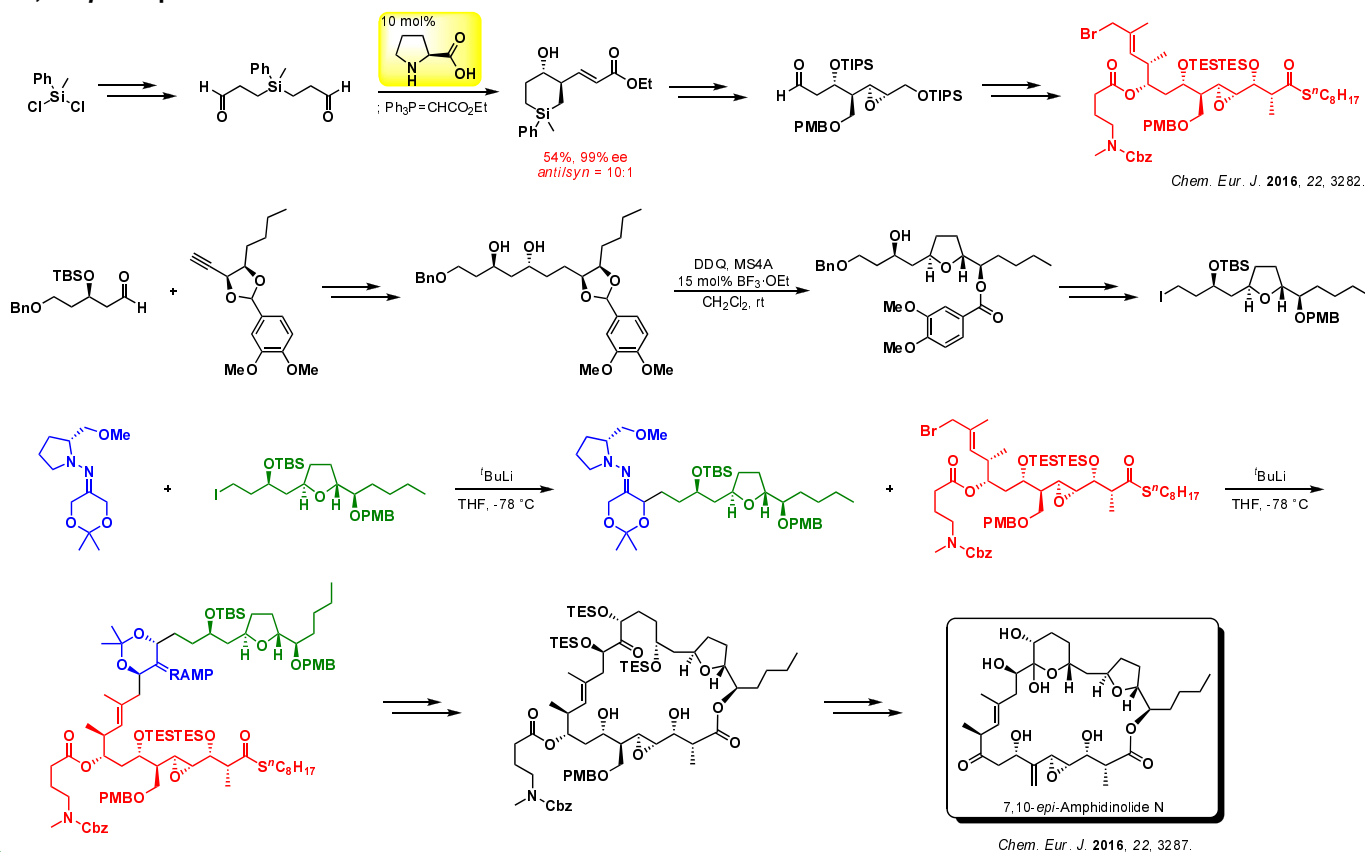
**(S)-baclofen**



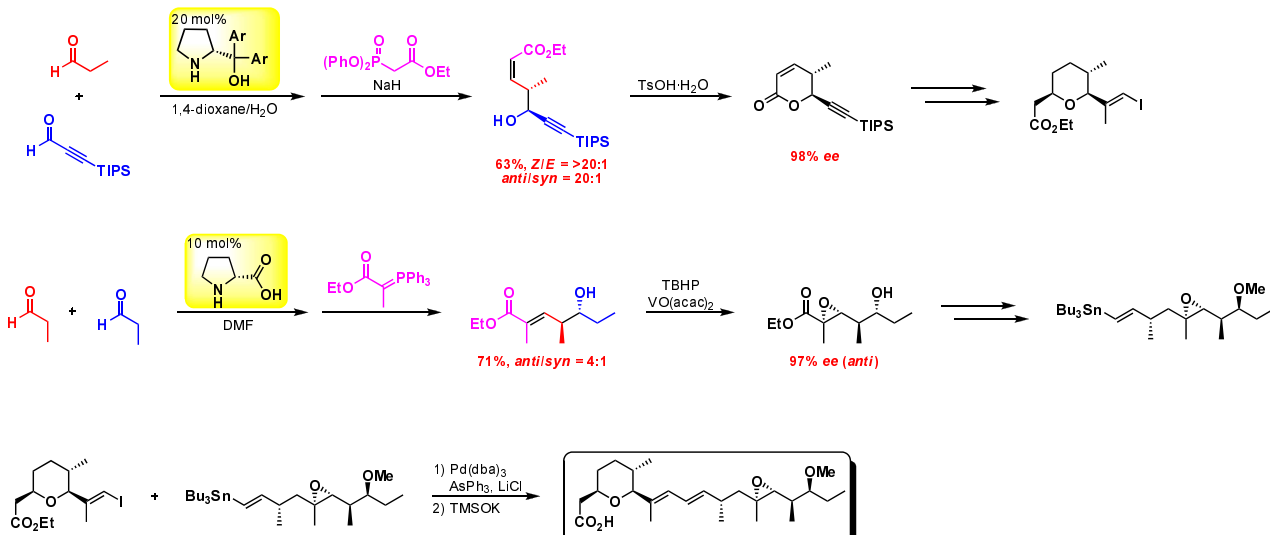
**formal total synthesis of ezetimibe**



**7,10-*epi*-Amphidinolide N**



**RQN-18690A**



Org. Lett. 2016, 18, 3382.