

Collective Asymmetric Total Synthesis of C-11 Oxygenated *Cephalotaxus* Alkaloids

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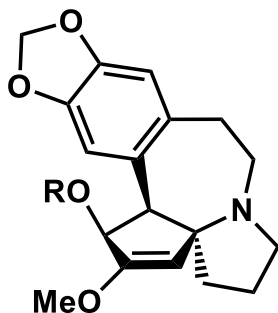
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College of Pharmacy

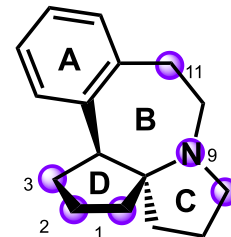
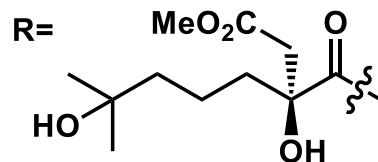
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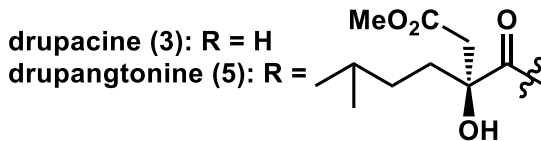
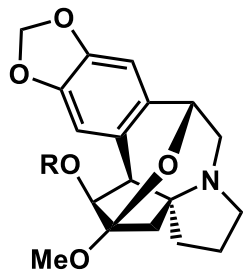
cephalotaxine (1): R = H
homoharringtonine (2)



azaspiranic
tetracyclic backbone

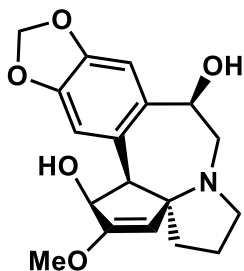
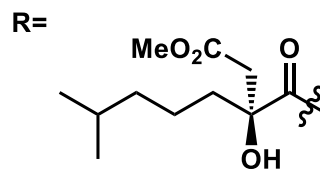
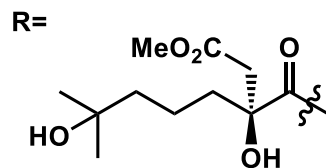
● : sites oxidation
patterns differ

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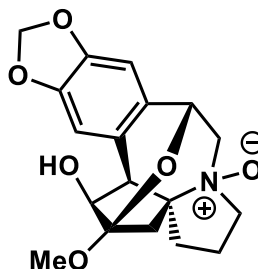


cephalezomine (6):

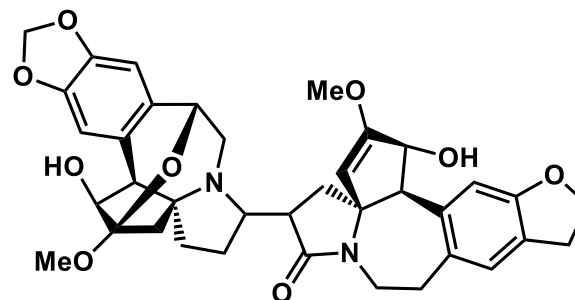
cephalezomine B (7):



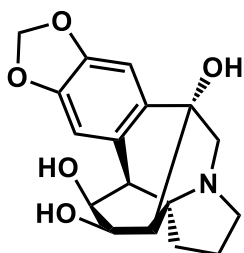
11-hydroxy-
cephalotaxine (4)



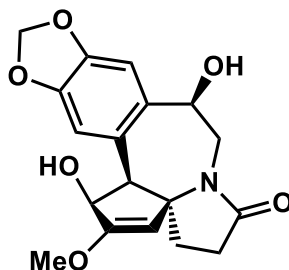
cephalancetine B (8)



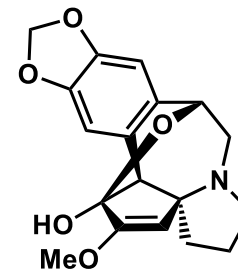
cephalancetine D (9)



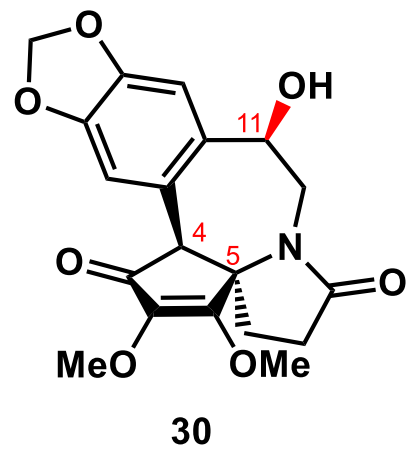
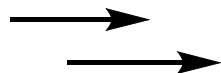
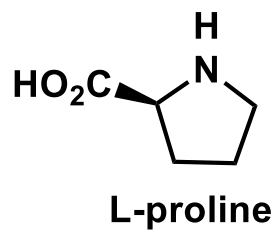
cephalocyclidin A (10)

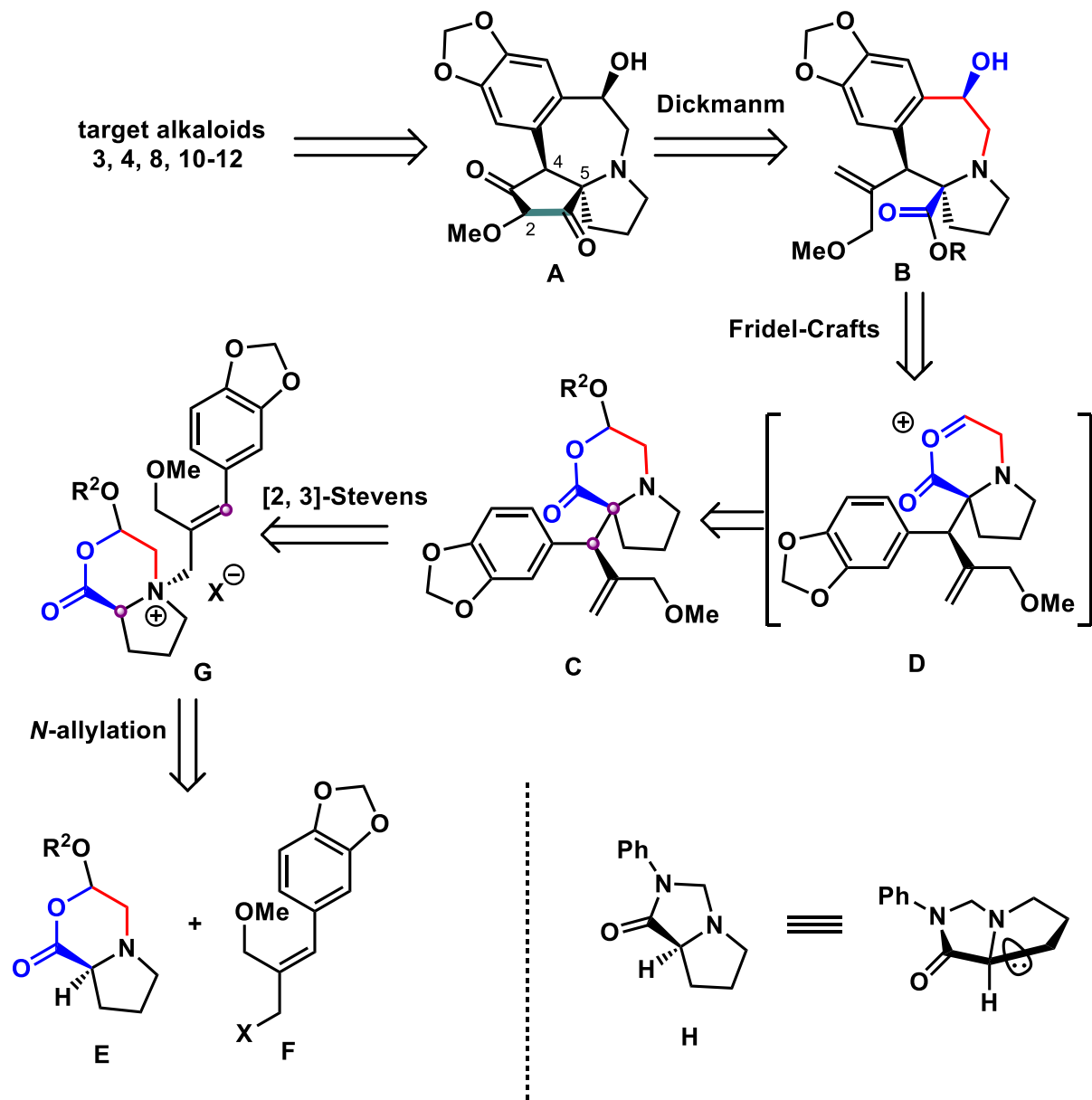


torreyafargesine A (11)

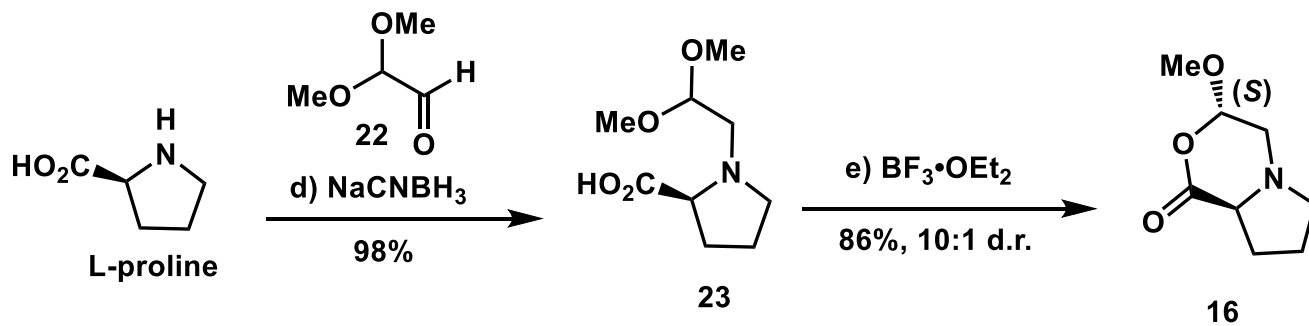
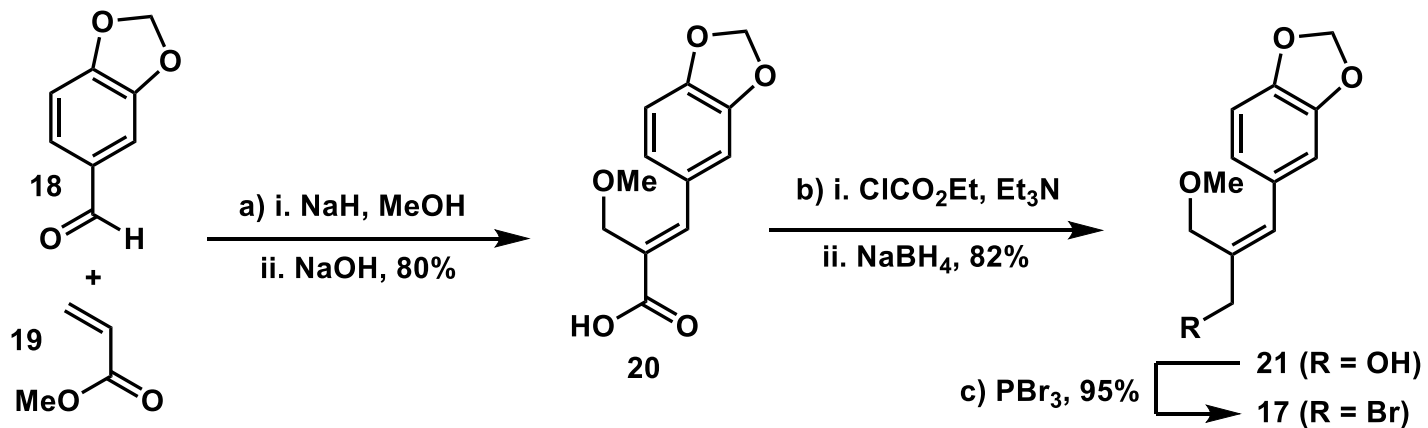


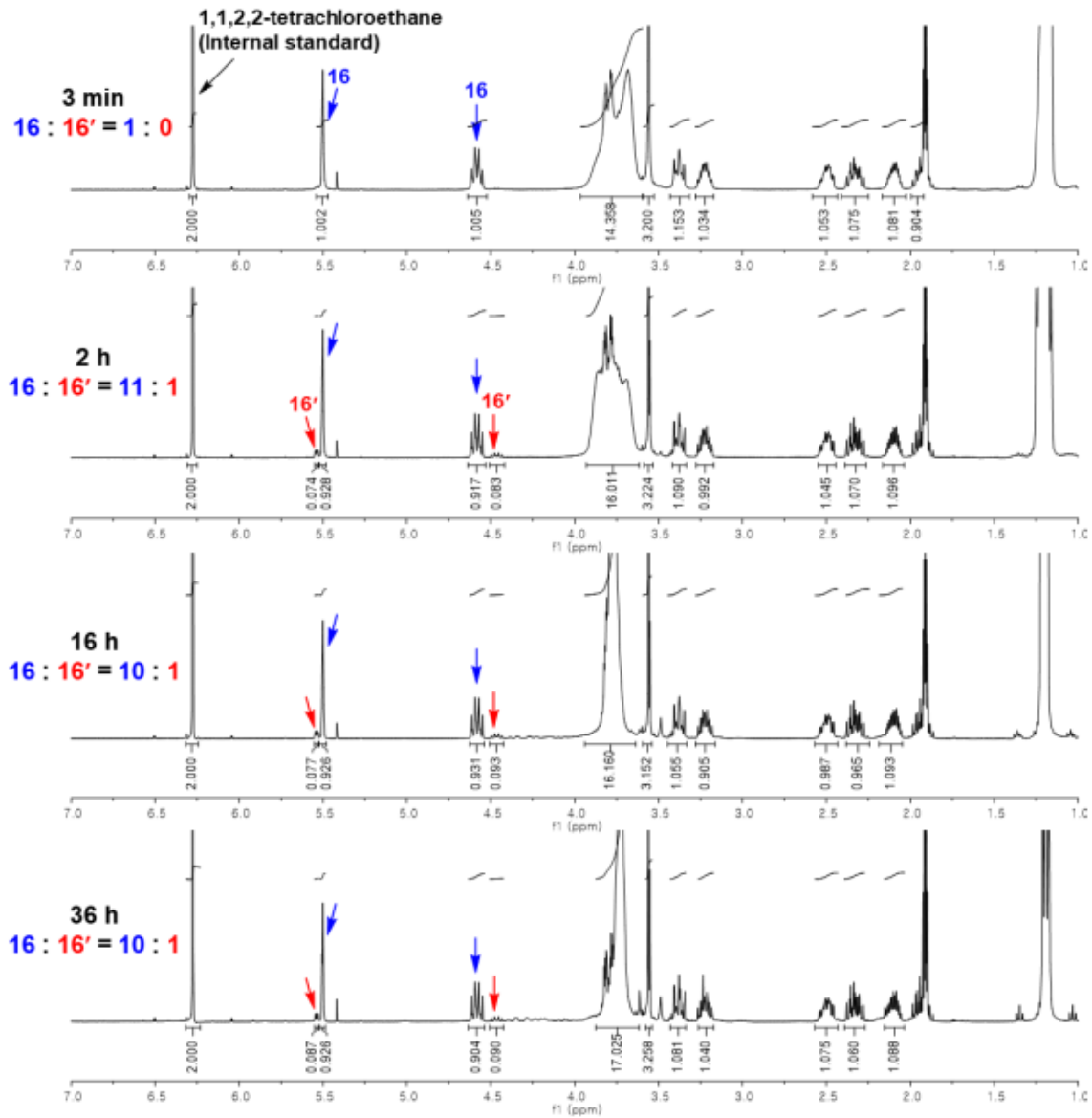
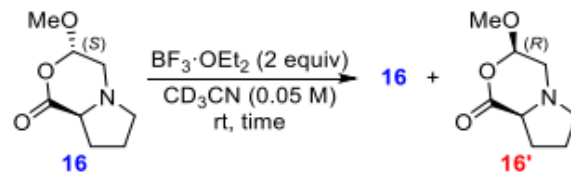
11-hydroxycephalotaxinone
hemiketal (12)

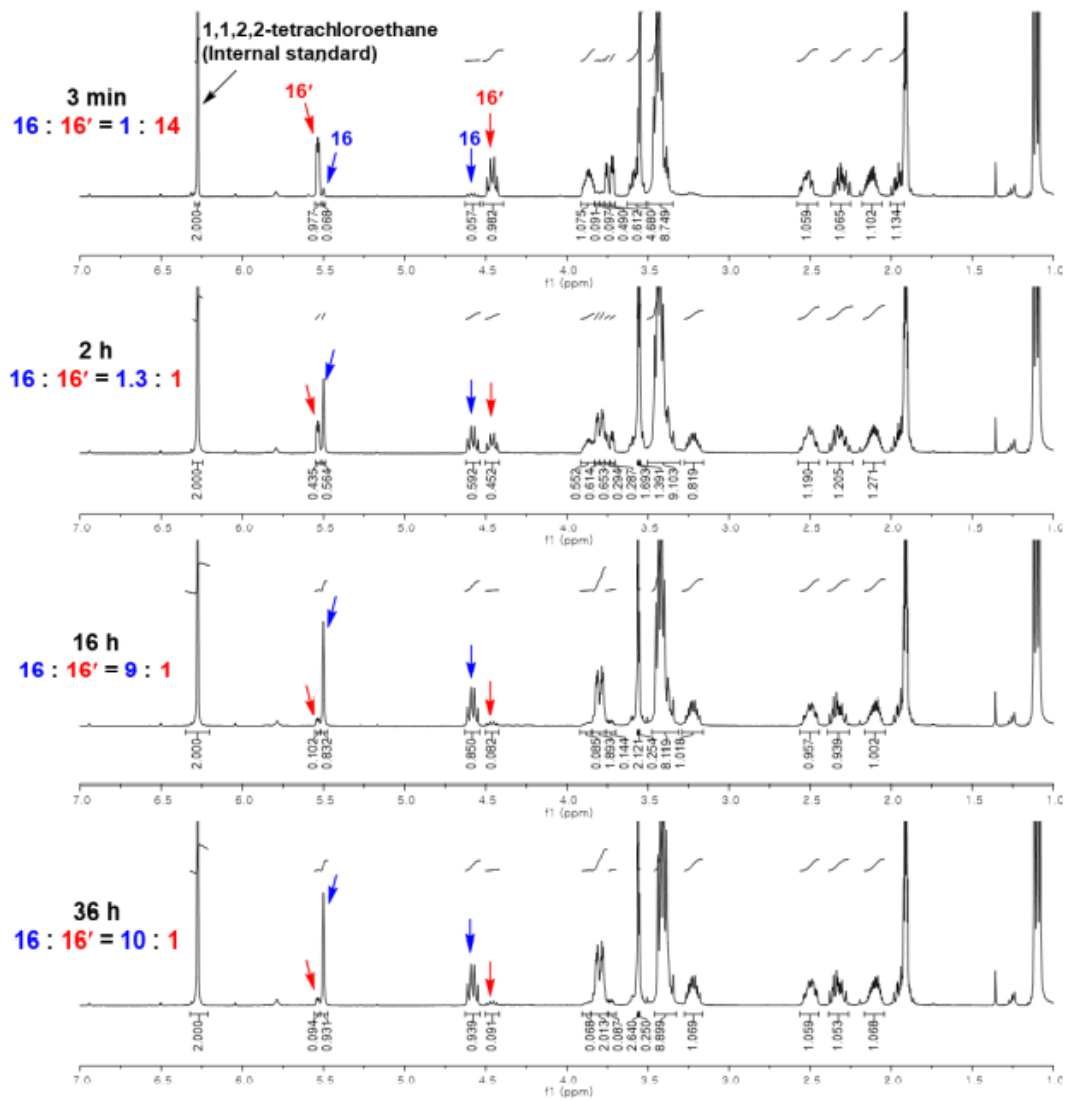
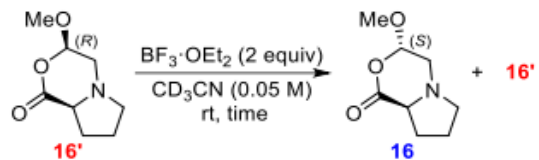


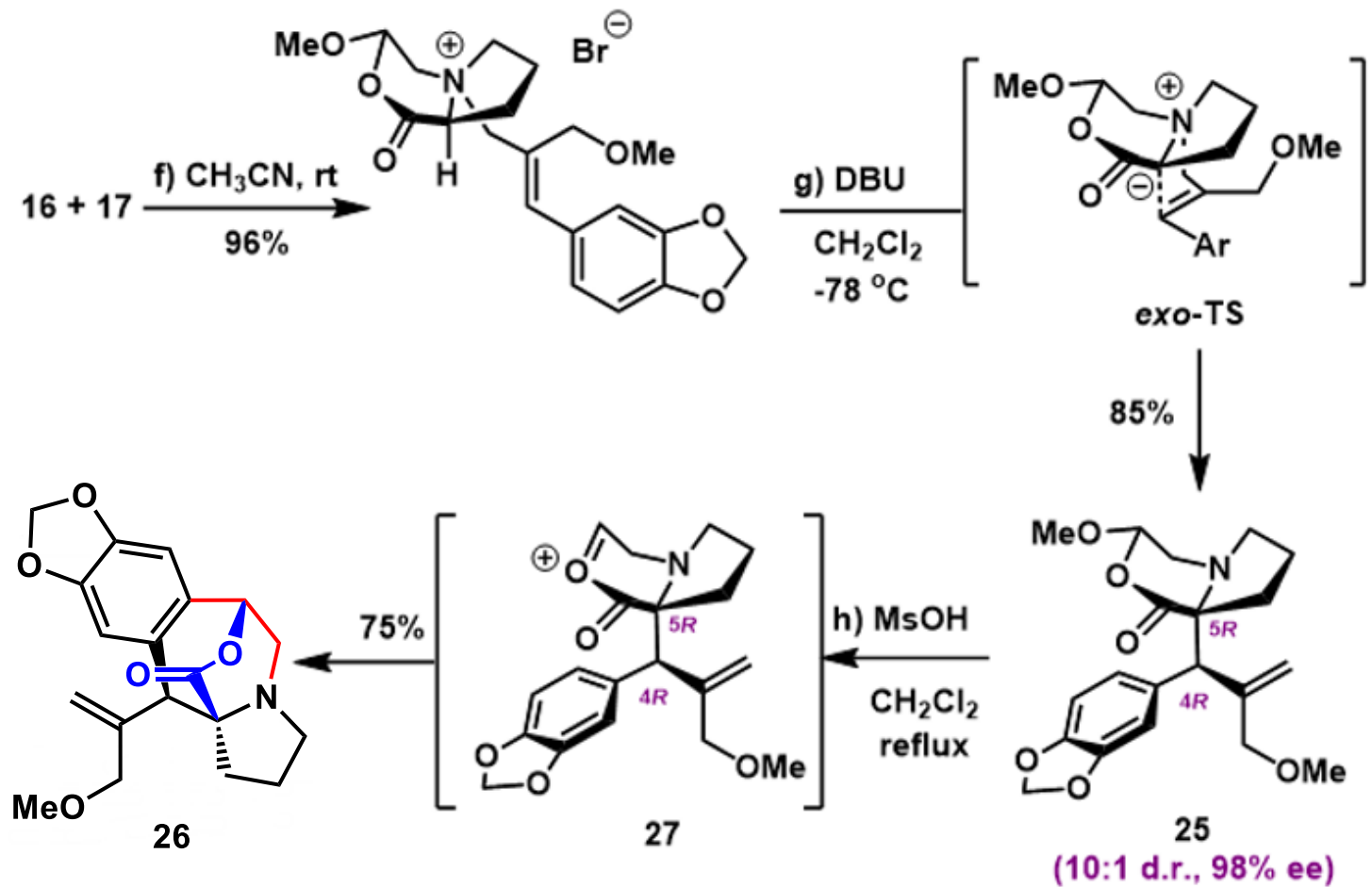


(A)









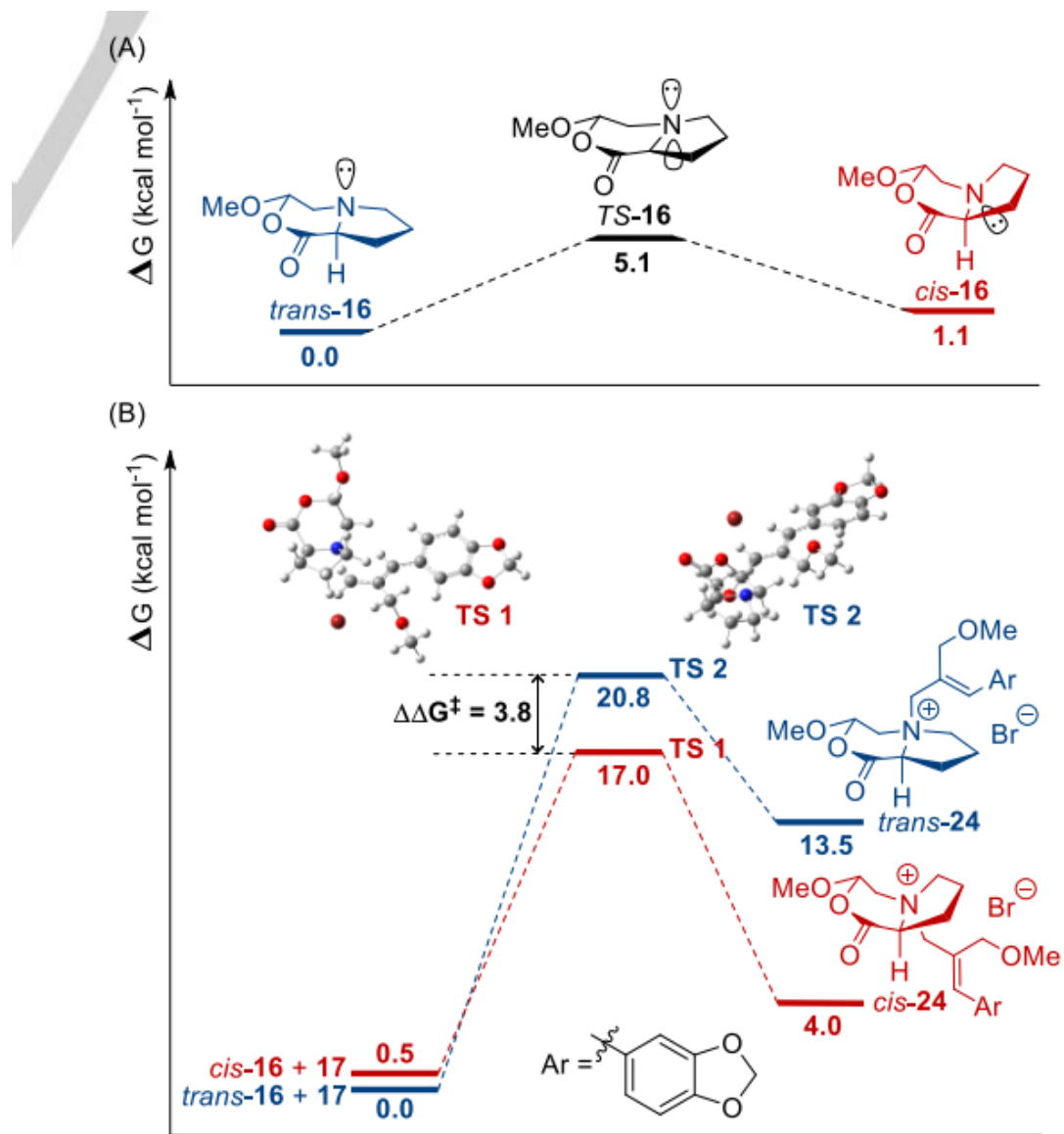


Figure 2. DFT computational investigations calculated at the B3LYP/6-31+G(d) level of theory. (A) Energy profiles of **16** in MeCN. (B) Energy profiles for the diastereoselective *N*-quarternization of **16** with **17**.

