Synthesis Challenge #71

Total Synthesis of Astellatol

N. Zhao, S. Yin, S. Xie, H. Yan, P. Ren, G. Chen, F. Chen, J. Xu,

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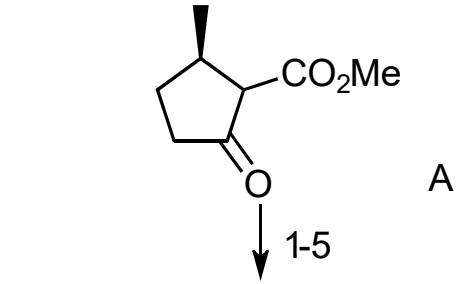
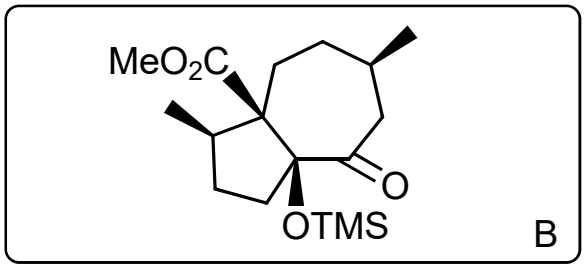


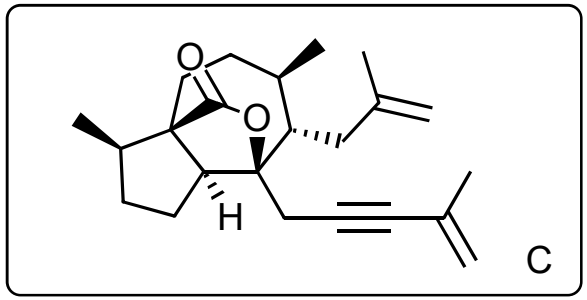
A

1-5



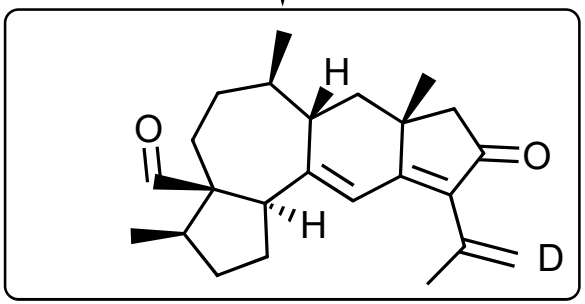
B

6-10



C

11-14

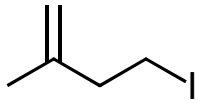


D

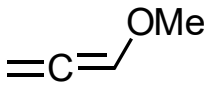
1) **I**, Cs_2CO_3, HMPA, 1,4-dioxane
2) **II**, *n*-BuLi, THF −78ºC
3) TMSOTf, Et_3N, CH_2Cl_2, then 1M HCl
4) Grubbs-II-Catalyst, PhMe, 90ºC
5) Pd/C, H_2, 730 psi, MeOH, rt

6) 10% HCl, THF
7) SmI_2, THF −78ºC
8) LDA,methylallyl bromide, THF, −78ºC
9) Mg, $HgCl_2$ (cat.), 3-bromopropyne
10) $PdCl_2(PPh3)_2$, CuI, Et_3N, 2-bromo-propene

11) $Co_2(CO)_8$, PhMe, 70ºC
12) DBU, HMPA, rt, then $Et_3O^+BF_4^-$ DIPEA, CH_2Cl_2, rt
13) DIBAL-H, CH_2Cl_2, 0ºC
14) TPAP, NMO, CH_2Cl_2, rt



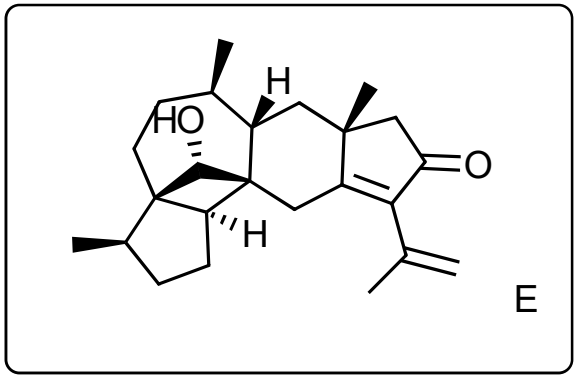
I



II

15-17

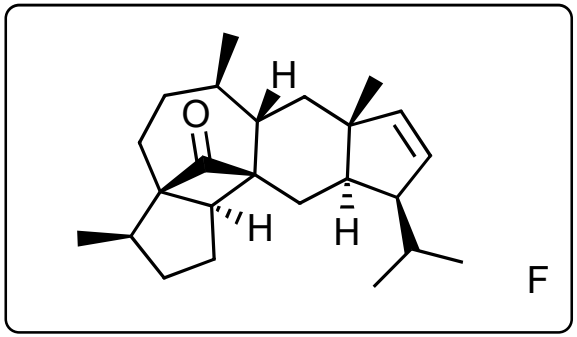
15) SmI_2, MeOH, HMPA, THF −78ºC
16) Crabtree's Catalyst, H_2, CH_2Cl_2, rt
17) TPAP, NMO, CH_2Cl_2, rt



E

18) NaHMDS, THF, −78ºC, then Davis oxaziridine
19) $NaBH_4$, $CeCl_3$* 7 H_2O
20) Crabtree's Catalyst, H_2, 500 psi CH_2Cl_2, rt
21) $(Im)_2C=S$, PhMe, 110ºC
22) $P(OMe)_3$, 110ºC

18-22



F

23) MeLi, THF, 50ºC
24) Py, $SOCl_2$, CH_2Cl_2
25) BH_3*Me_2S, THF, RT, then H_2O_2, NaOH, 0ºC

23-25