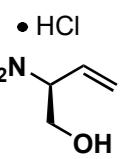
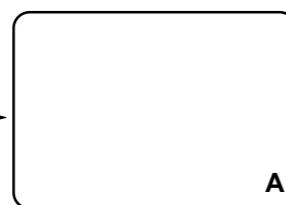


Total Synthesis of Yuzurine-type Alkaloid Daphgraciline



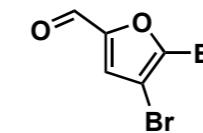
1) TsCl, NEt₃, DCM, 80%
2) TIPSOTf, 2,6-Lutidin, DCM, 96%



Li, L.-X.; Min, L.; Yao, T.-B.; Ji, S.-X.; Qiao, C.; Tian, P.-L.; Sun, J.; Li, C.-C.

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3i) DIBAL, DCM, -78 °C
ii) TBSCl, imidazole, 0 °C, 93%
4i) nBuLi (1 eq.), THF -78 °C
ii) BOMCl, THF, 25 °C
iii) nBuLi (1 eq.), THF -78 °C
iv) CH₂O_(g), -78 °C, THF, 73%



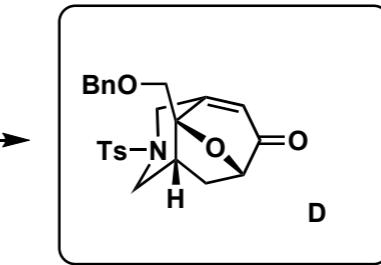
B

5) DIAD, PPh₃, THF, 0 – 25 °C 73%
6) pTsOH (10 mol%), MeOH, 0 °C, 70%
7i) mCPBA, DCM, 0 °C
ii) Ac₂O, NEt₃, DCM, 0 °C, 85%

A+B

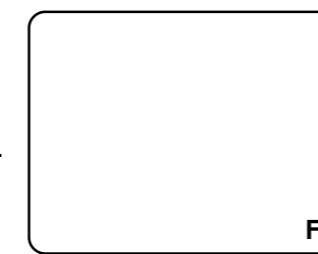


8) quinidine (50 mol%), DCM, 25 °C, 71%
9) TBAF, THF, -20 °C
10) DMP, NaHCO₃, DCM, 0 °C
11) [Rh(PPh₃)₃Cl] (2 eq.), toluene, 120 °C, sealed tube, 60% (3 steps)

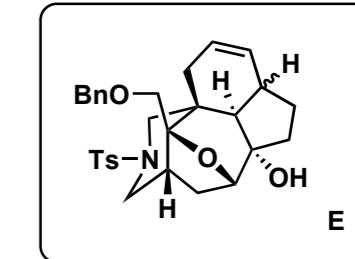


12) ? Br-allyl
13) ?

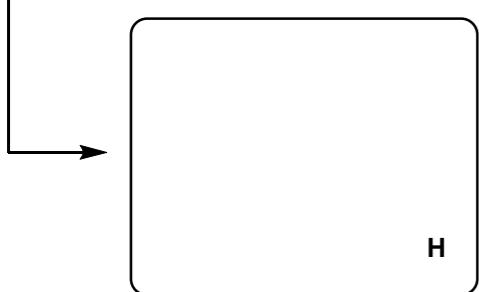
18i) NaH (25 eq), THF, 0 °C
ii) CS₂ (35 eq), THF, 0 °C
iii) MeI (40 eq), THF, 25 °C
19) chlorobenzene, 148 °C, 92% (2 steps)
20) SmI₂, THF, 25 °C, 85%
21i) DIBAL (5 eq), DCM, -78 °C
ii) TIPSCl, imidazole, DCM 0 – 25 °C, 64% (2 steps)



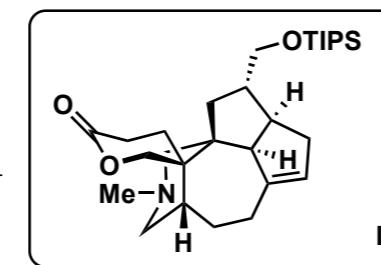
14) K₂OsO₄, NMO, MeSO₂NH₂, THF/tBuOH/H₂O, 25 °C
15) IBX, DMSO, 25 °C
16) 5.5 M KOH, tBuOH, 90 °C
17) TMSCHN₂, toluene/MeOH 10:1, 25 °C, 45% (4 steps)



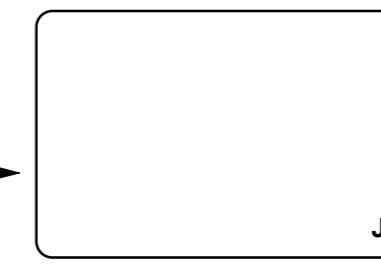
22i) Li, EtNH_{2(l)}, -78 °C
ii) EtOH, MeI, 25 °C
23) KHMDS, Ts-imidazole, THF, 0 °C, 40% (2 steps)



24i) [TiCp₂Cl₂], Zn, THF, 25 °C
ii) H, malononitrile, THF, 70 °C
iii) H₂O, 70 °C, 81%



25) EtMgBr (1 eq), Et₂O, -78 °C
26) pTsOH, MeOH, 25 °C, 62% (2 steps)
27) DMP, DCM, 25 °C
28) MeOH, KOH, I₂, 0 °C, 79% (2 steps)



29i) TPP, O₂, hν, CDCl₃, -55 °C
ii) P(OEt)₃, 70%
30) MgSO₄, 1,2-Dichlorobenzene, 140 °C, 83%
31) pTsOH, THF/H₂O, 80%

