**Total Synthesis of Haterumaimide J**

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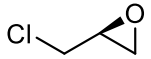
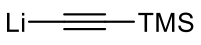



1-4

**A**

5-8

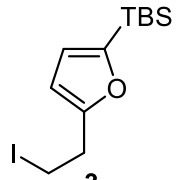
**B**




**1**

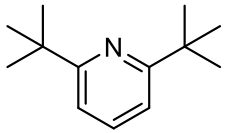

**2**

1) **1**, $BF_3$•$OEt_2$, THF –78 °C *then* NaOH
2) **2**, CuI, THF, –78 °C *then* $K_2CO_3$, MeOH
3) $Cp_2ZrCl_2$, $Me_3Al$, $CH_2Cl_2$, –45 °C. *then* $I_2$
4) triphosgene, pyridine, $CH_2Cl_2$, 45 °C




**3**

5) $(DHQD)_2PYR$, $K_2OsO_2(OH)_2$, $K_3Fe(CN)_6$
6) TsCl, DMAP, $Et_3N$, *then* $K_2CO_3$, MeOH
7) **3**, *t*-BuLi, 9-BBN-OMe, $Et_2O$/THF, *then* $Pd(dppf)Cl_2$, $K_3PO_4$, DMF
8) $EtAlCl_2$, DTBP, $CH_2Cl_2$/PhMe, –78 °C




DTBP

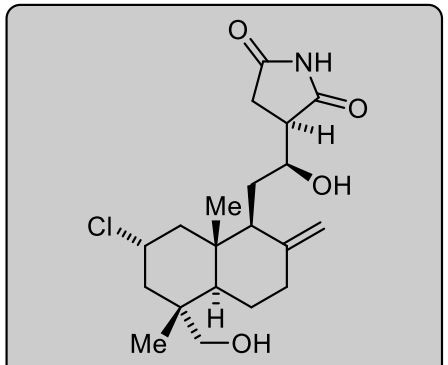
1) Name the starting material.

3) Name the reaction

5) Name the reaction - 6:1 syn:anti ratio.

7) Name the reaction, show a mechanism

8) Draw a 3 dimensional transition state

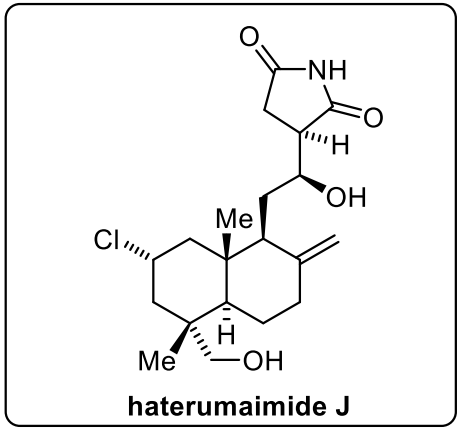



**haterumaimide J**

9-13

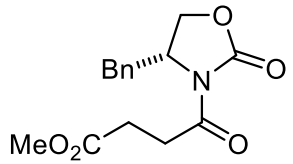
**B**

14-16




**haterumaimide J**

9) TBSCl, imidazole
10) $O_2$, rose bengal, hν, $CH_2Cl_2$, *then* TBAF, MeI
11) $H_2$, Pd/C
12) $Ph_3P{=}CH_2$
13) DIBAL-H




**4**

14) **4**, $Cy_2BOTf$, $NEt_3$, $CH_2Cl_2$
15) $NH_3$/MeOH, *then* NaH, THF
16) HF•pyr

10) What is the role of rose bengal?