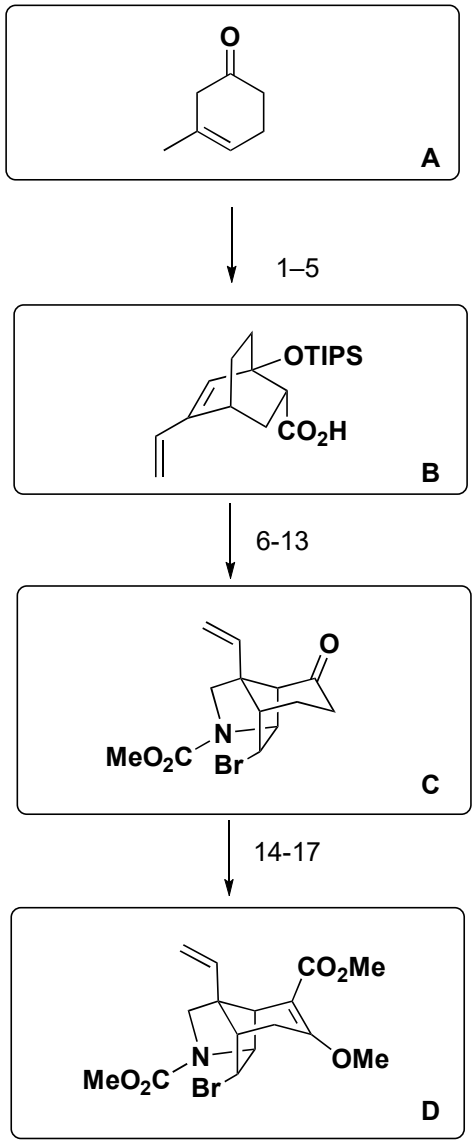
Total Synthesis of (±)-Gelsemine

W. G. Earley, J. E. Jacobsen, A. Madin, G. P. Meier, C. J. O'Donnell, T. Oh, D. W. Old, L. E. Overman, M. J. Sharp, J. Am. Chem. Soc **2005**, 127, 18046.



1) **A**, LDA, TIPSOTf
2) **1**, $AlCl_3$, –78°C
3) SeO_2
4) $Ph_3P{=}CH_2$
5) KOH

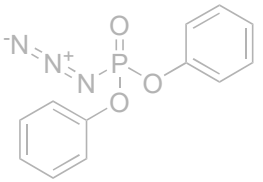
1

6) DPPA, Et_3N, PMBOH, reflux
7) TFA, anisole
8) CH_2O, KCN, pH=7 buffer
9) TBAF
10) KH, 18-Crown-6, *then* $ClCO_2Me$
11) KOH
12) Br_2 (1.1 equiv), PMP
13) TFA

14) KHMDS, TESCl
15) PhIO, $BF_3 \bullet OEt_2$, MeOH, CH_2Cl_2
16) KHMDS, Comin´s reagent
17) CO, $PdCl_2$(dppf), MeOH, DMF, n-Bu_3N, 80 °C

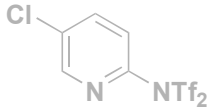
2) Name of the reaction Diels-Alder
3) Name of the reaction Riley Oxidation
4) Name of the reaction Wittig Olefination

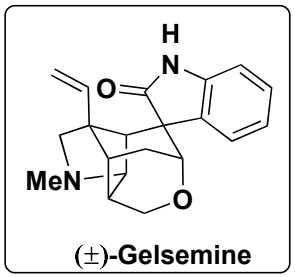
6) Name of the reaction Curtius Rearrangement
Structure of DPPA
Provide a mechanism



10) Name of the reaction
Provide a mechanism Aza-Cope Rearrangement
11) *Hint:* Selective cleavage
13) *Hint:* 5/5/6 system is formed

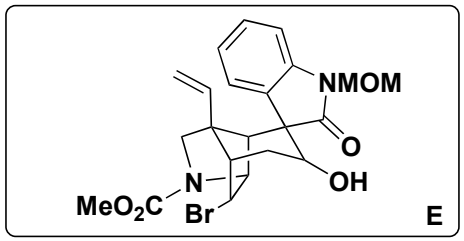
16) Structure of Comin´s reagent





(±)-Gelsemine

18-22



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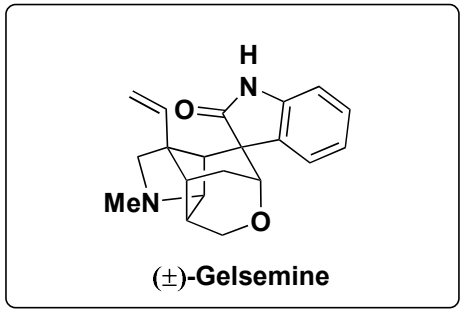
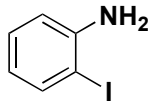
23-31



(±)-Gelsemine

18) **2**, $AlMe_3$
19) NaH, MOMCl
20) $Pd_2(dba)_3$, Ag_3PO_4, Et_3N, THF
21) HCl, MeOH
22) DIBAL-H



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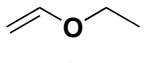

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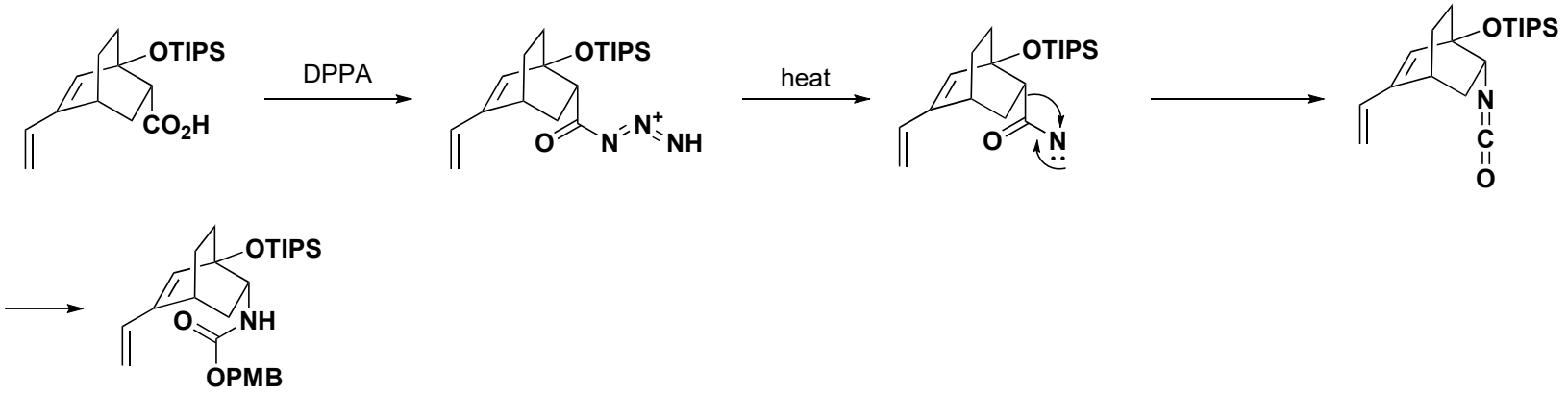
23) PPTS, **3**
24) NaCN, DMSO, 150 °C
25) MeOTf, CH_2Cl_2, DTBMP
26) NaCN, DMSO, 90 °C
27) TsOH
28) DBU, toluene, 110 °C
29) HCl, *i*-Pr_2NEt
30) DIBAL-H
31) Et_3SiH, TFA, 45 °C

20) Name of reaction Heck-Coupling

21) This is not a MOM cleavage

24) *Hint:* An aziridine is formed

Curtius-Rearrangement



Aza-Cope Rearrangement