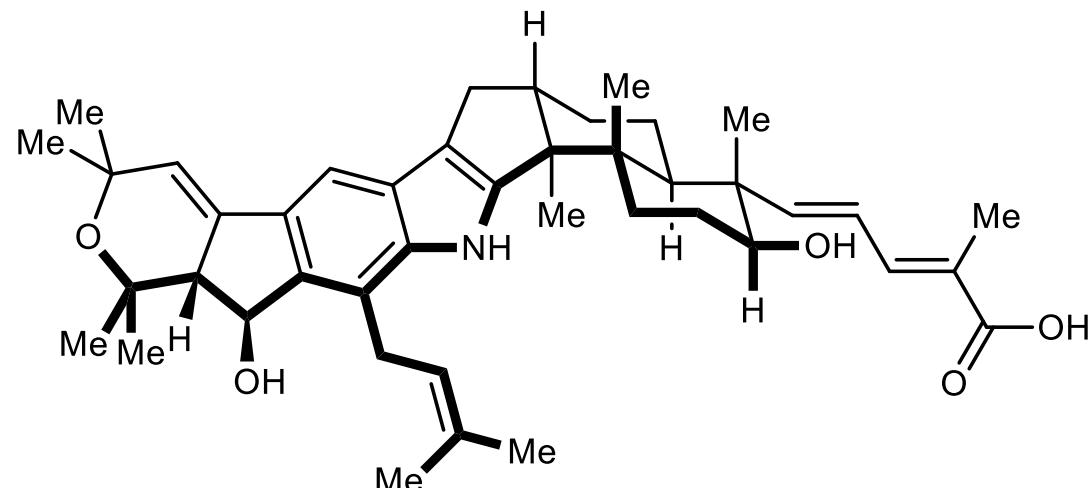


# Twelve-Step Asymmetric Synthesis of (−)-Nodulisporic Acid C

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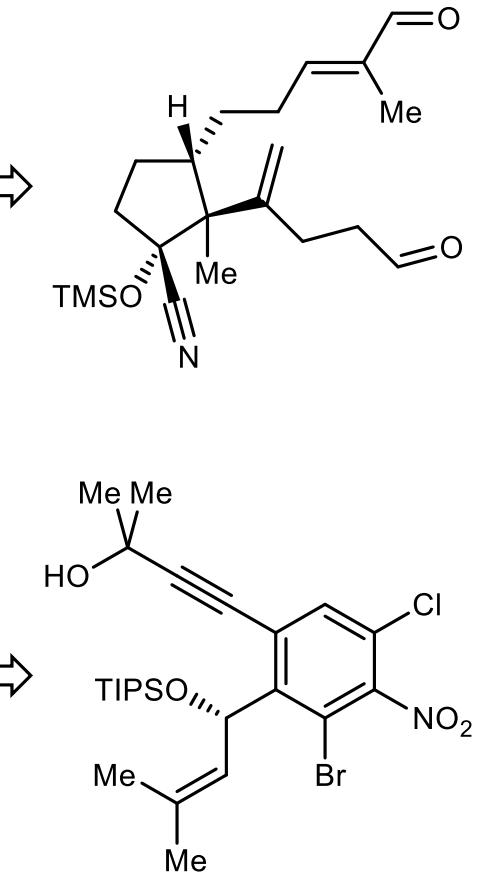
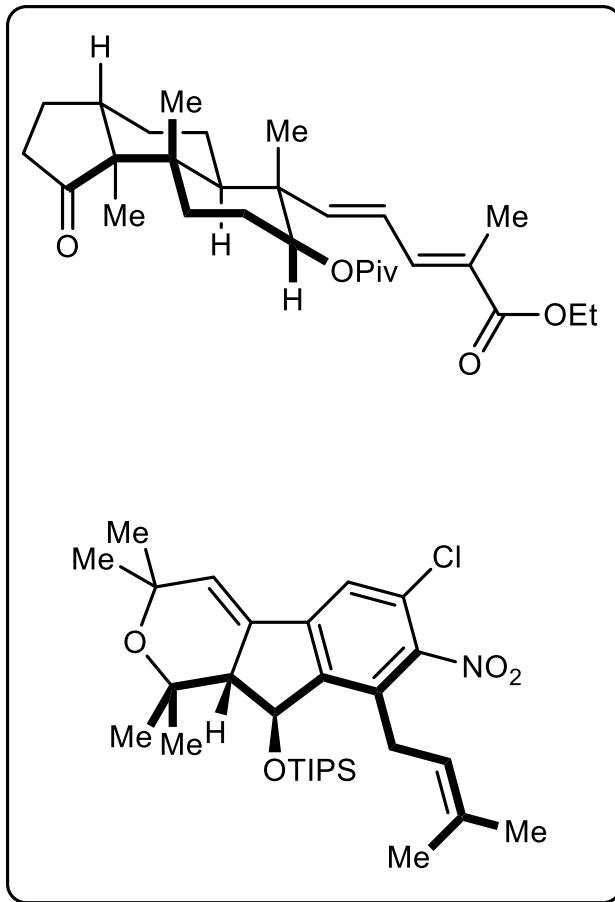
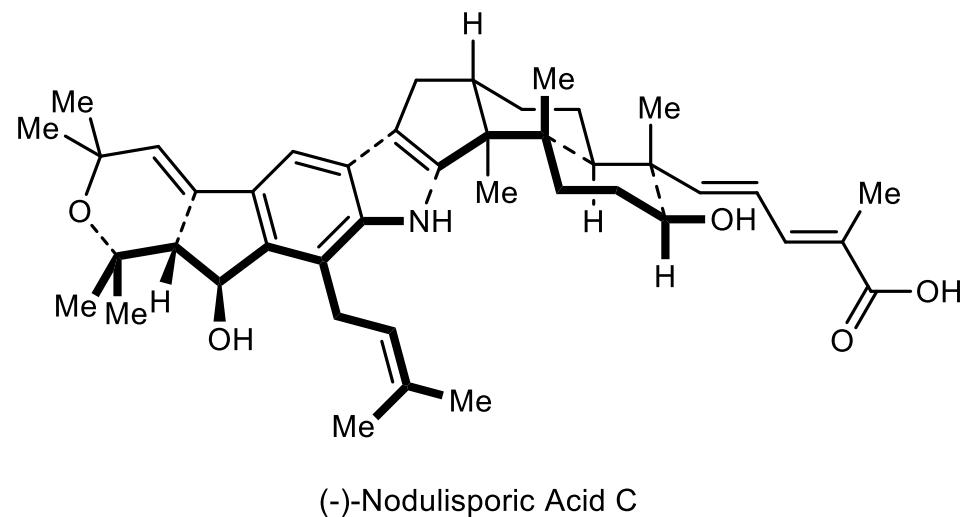


(−)-Nodulisporic Acid C

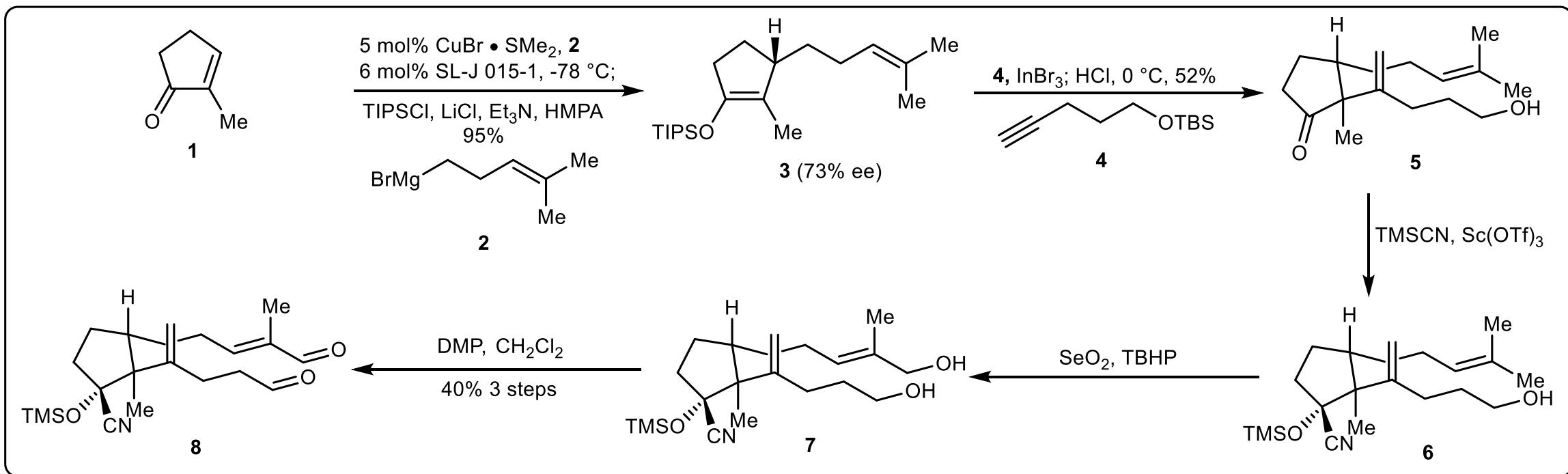
- isolated from the endophytic fungus *Hypoxyylon pulicidum*
- potent insecticidal activities
- biological effects arise from the specific activation of a subset of ligand-gated chloride ion channels

Liu Research Group  
Total Synthesis Presentation  
Ziyong Wang  
11/1/2018

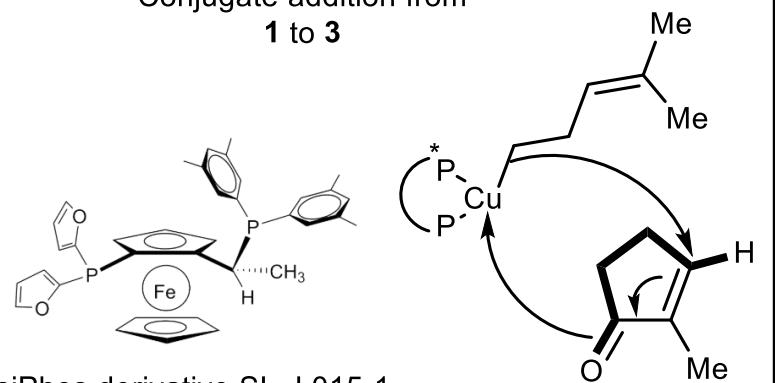
Retrosynthetic Analysis:



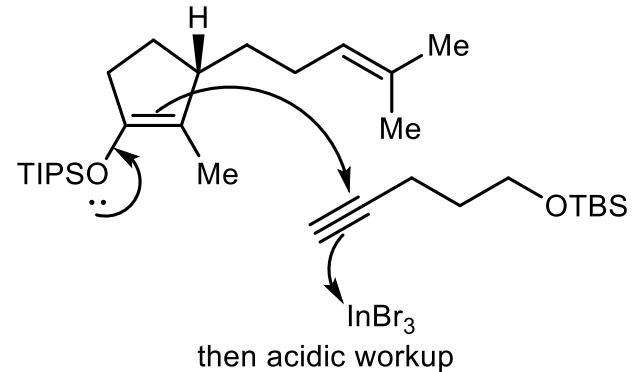
Synthesis of Terpenoid Fragment



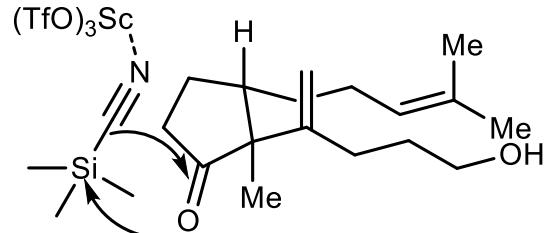
Conjugate addition from  
**1** to **3**



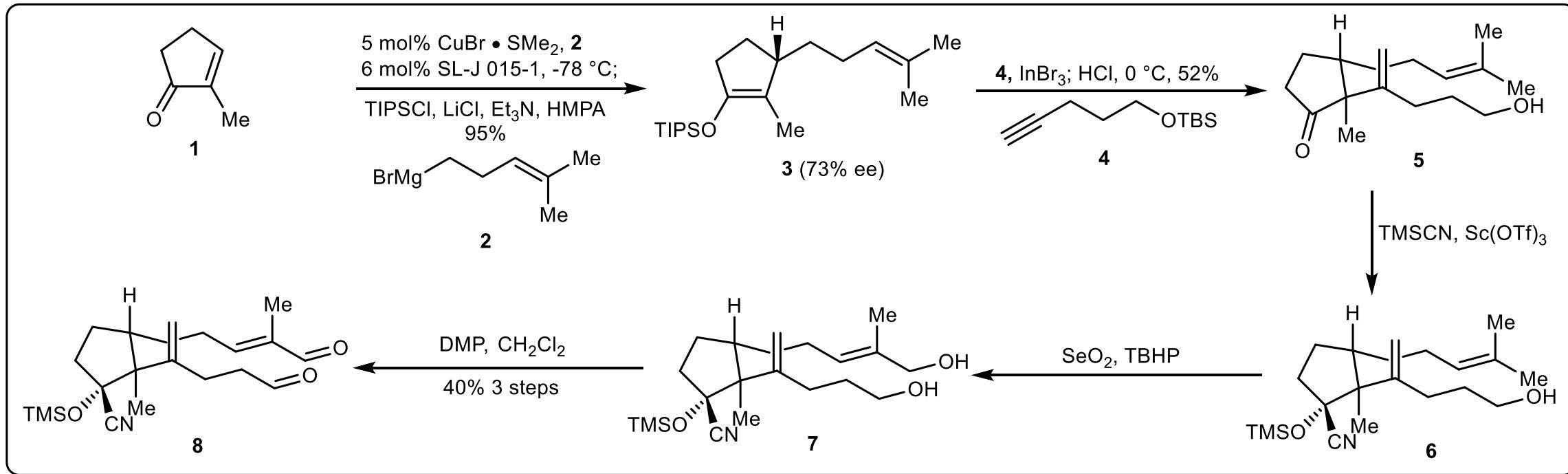
Mechanism from **3** to **5**



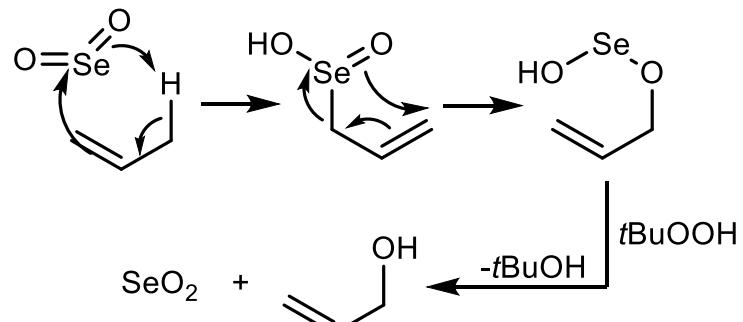
Mechanism from **5** to **6**



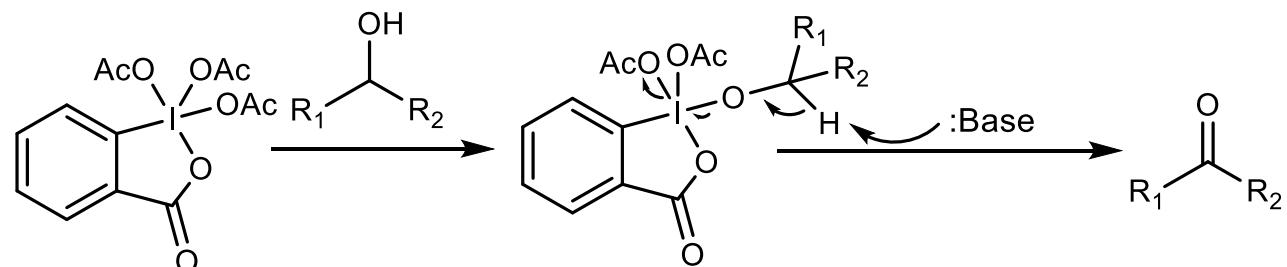
Synthesis of Terpenoid Fragment



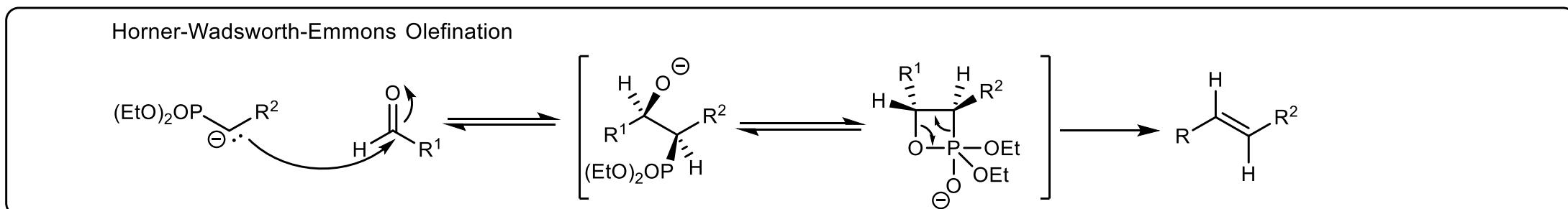
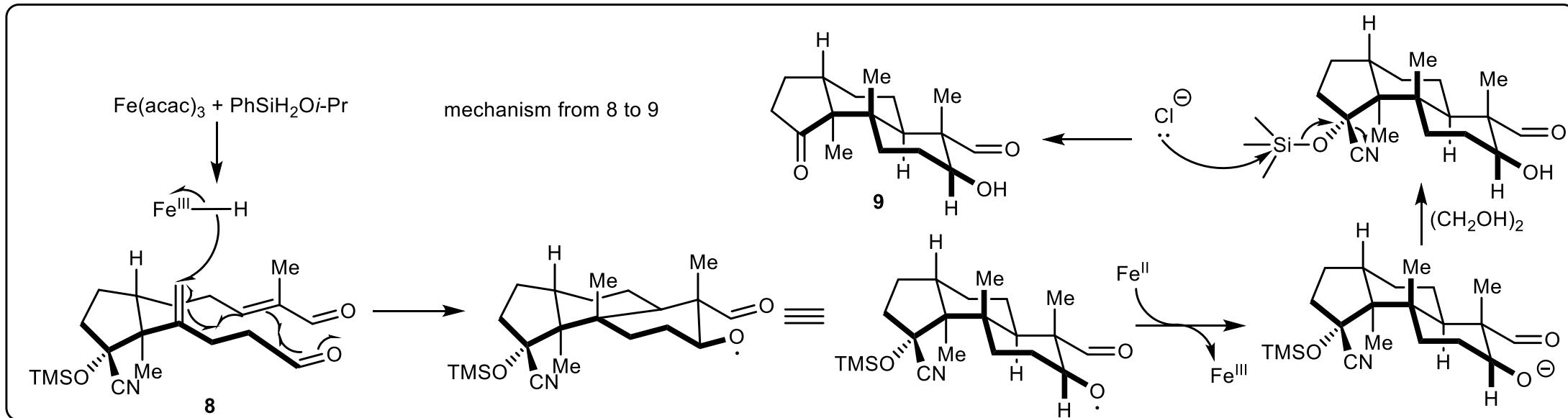
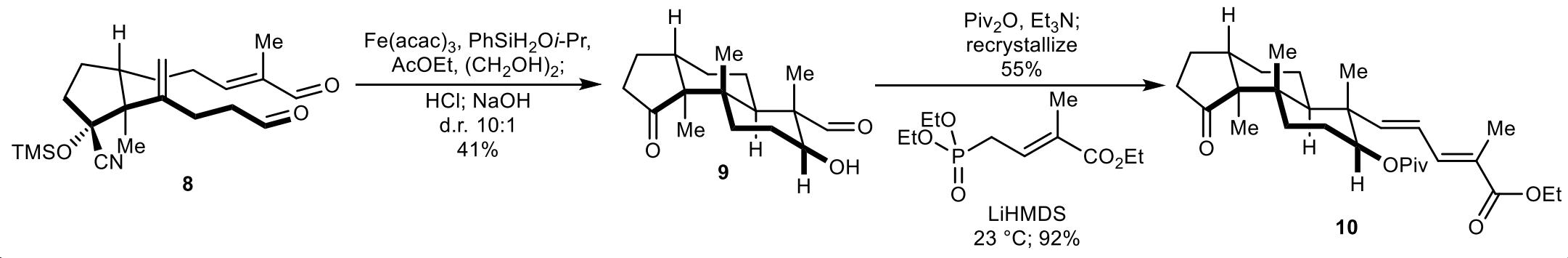
mechanism from **6** to **7**



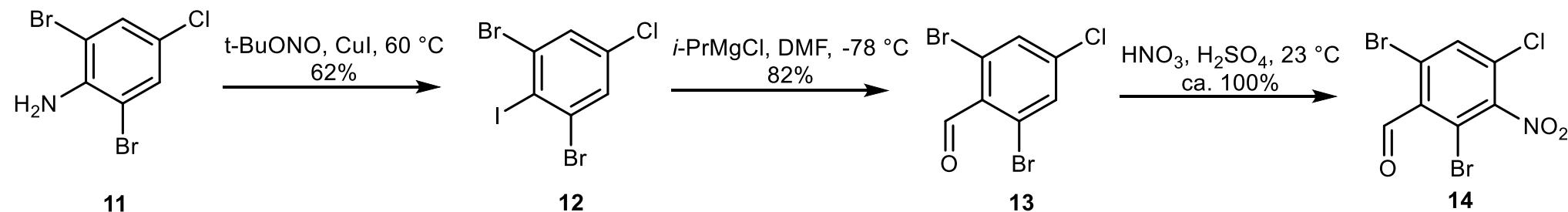
Mechanism from **7** to **8**



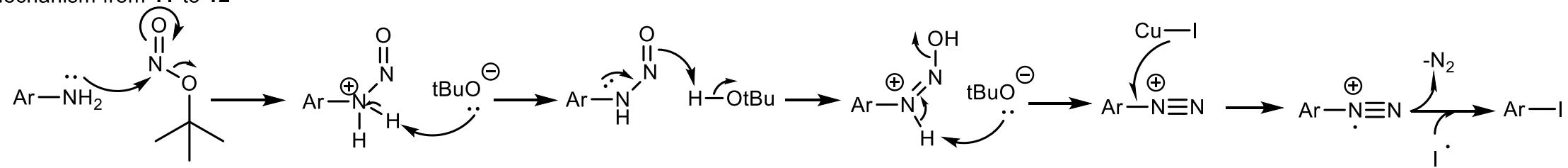
Synthesis of Terpenoid Fragment



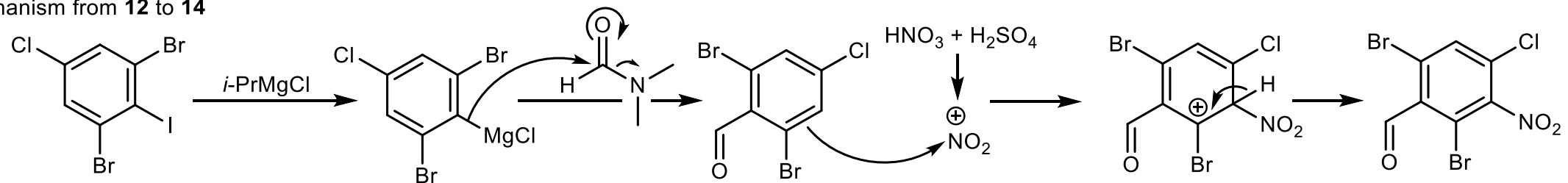
Synthesis of Indenopyran Fragment



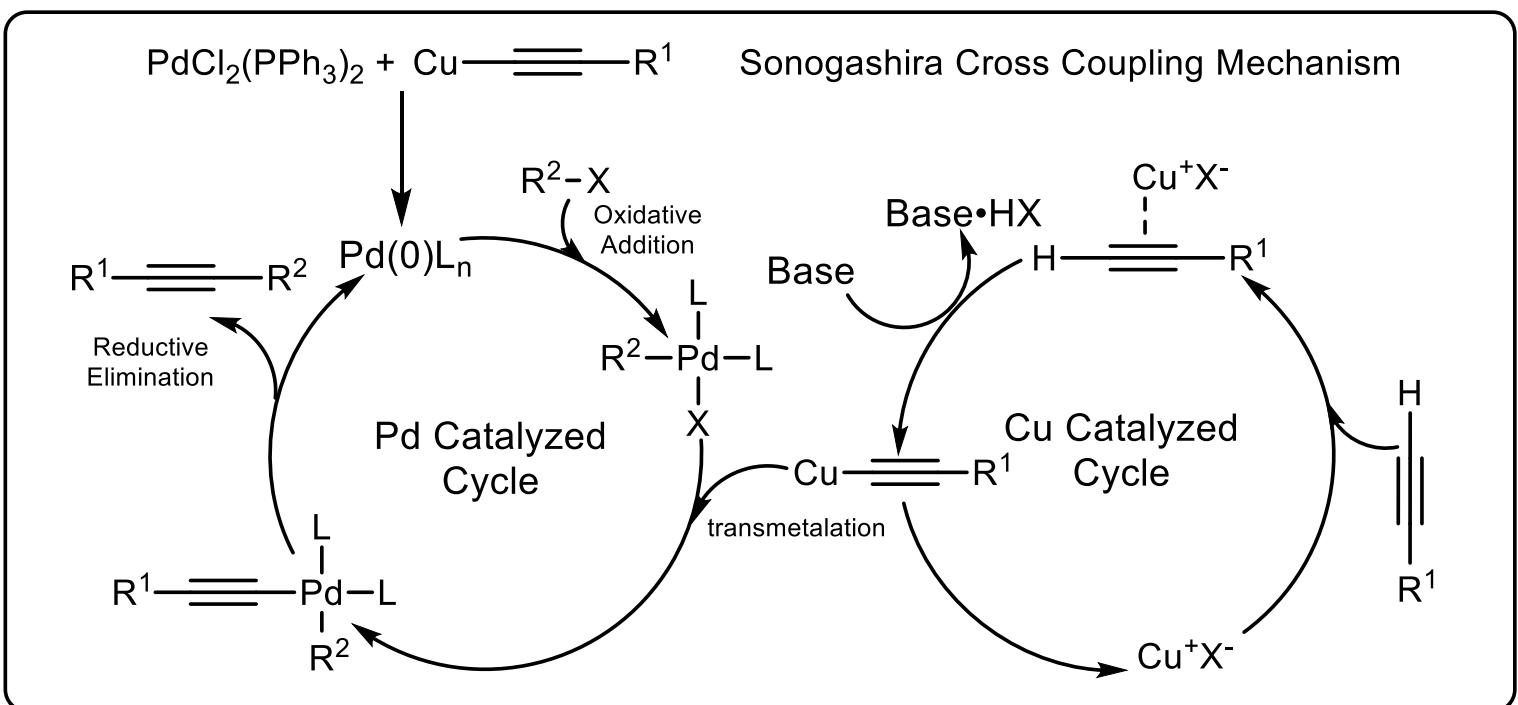
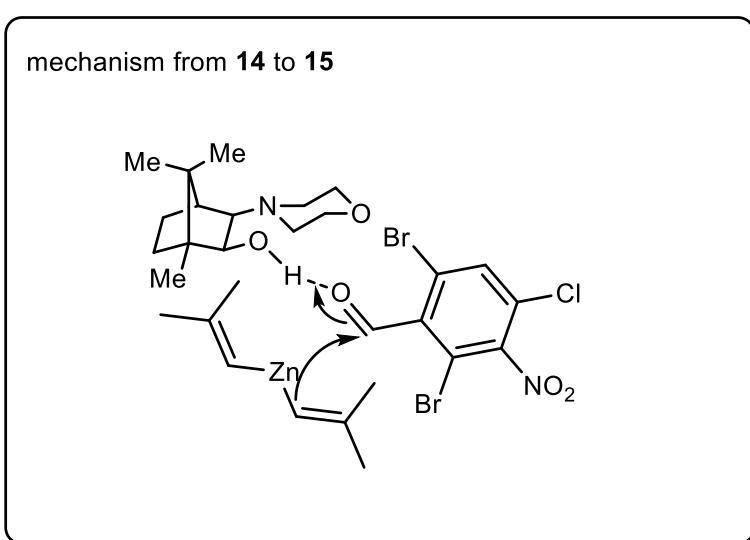
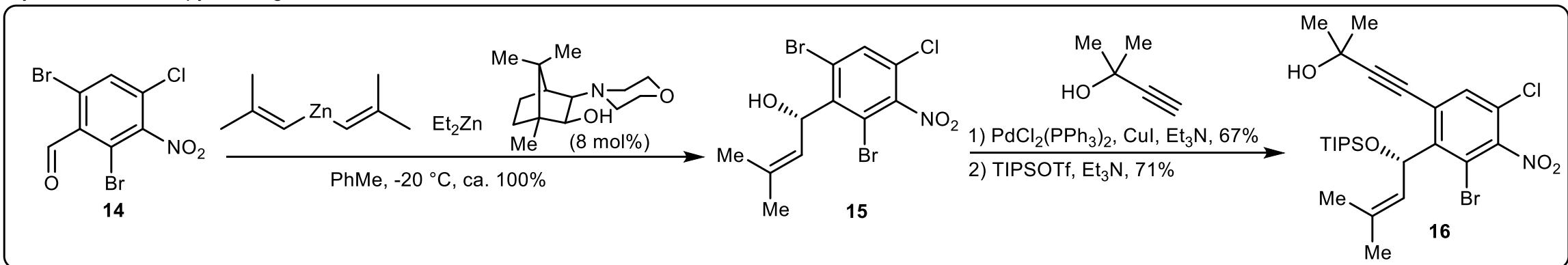
mechanism from **11** to **12**



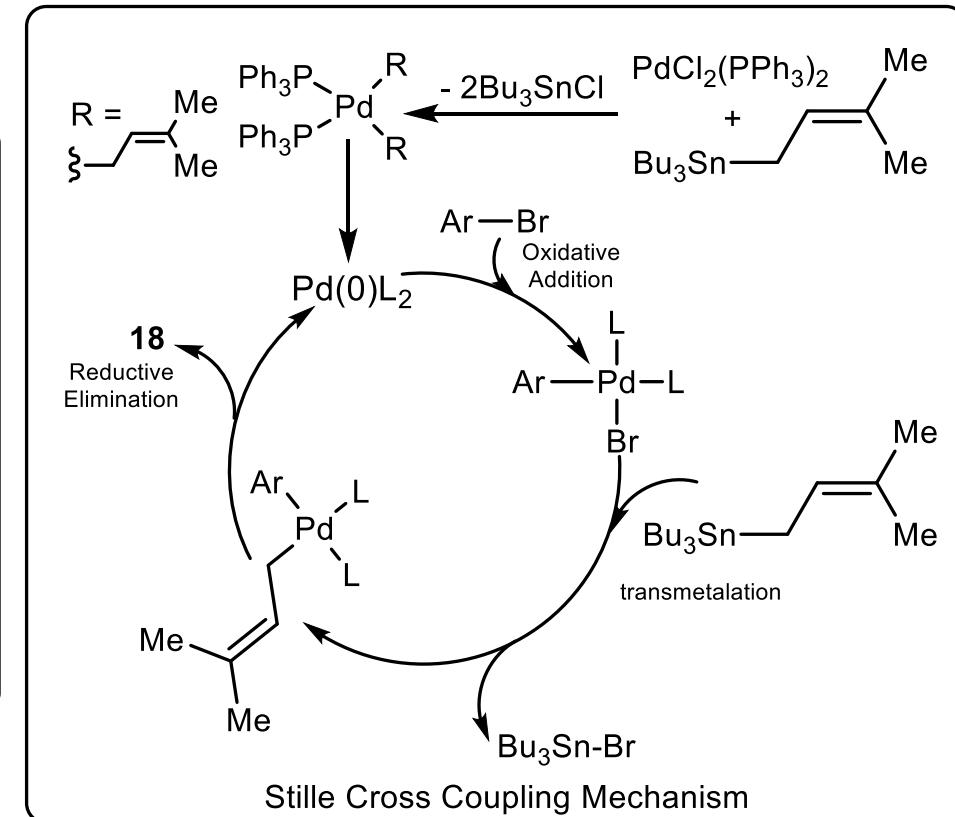
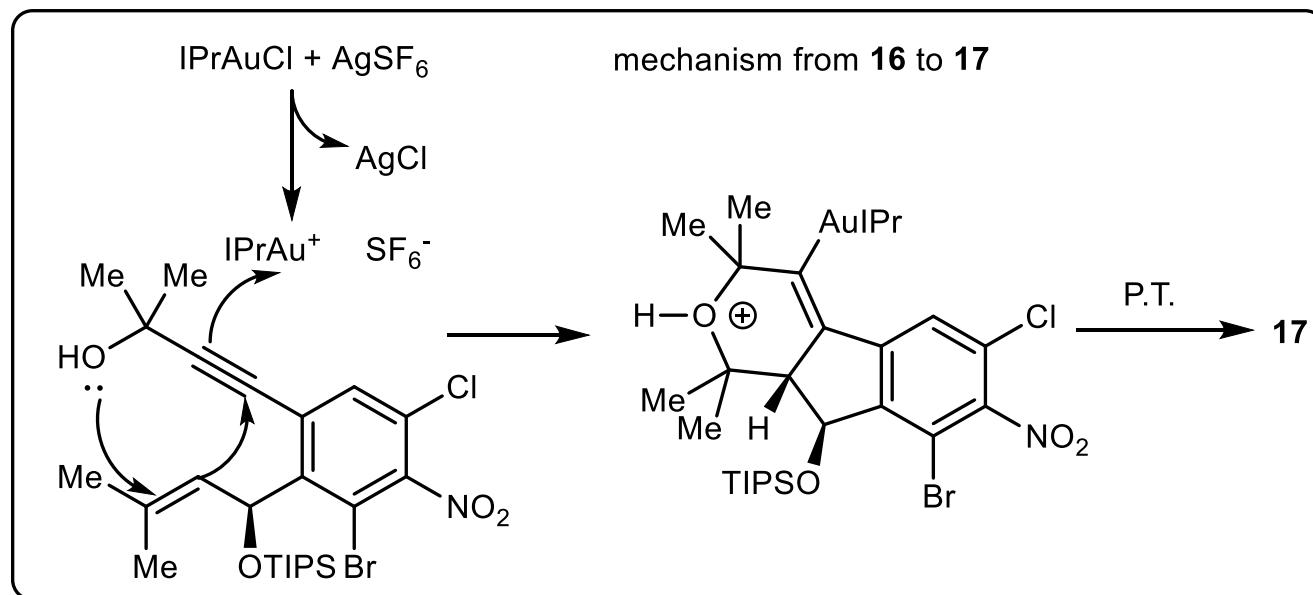
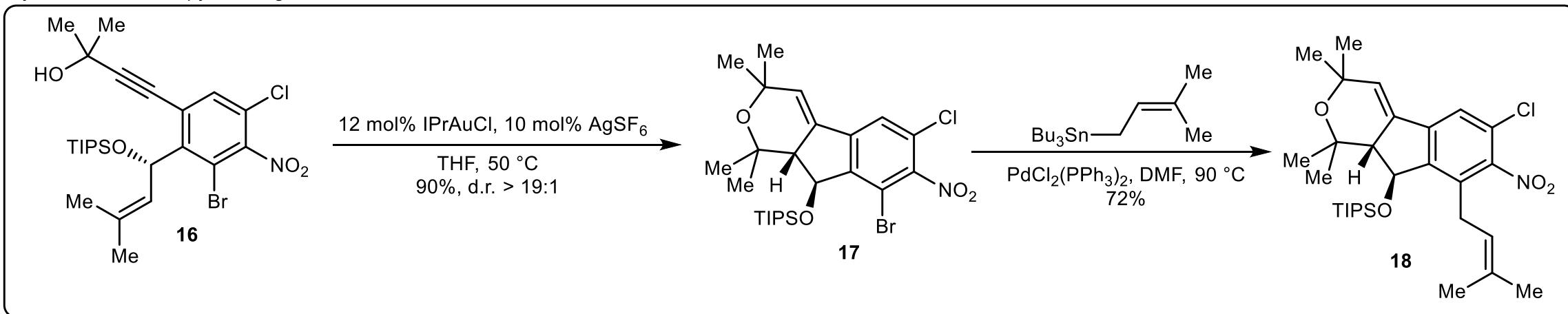
mechanism from **12** to **14**



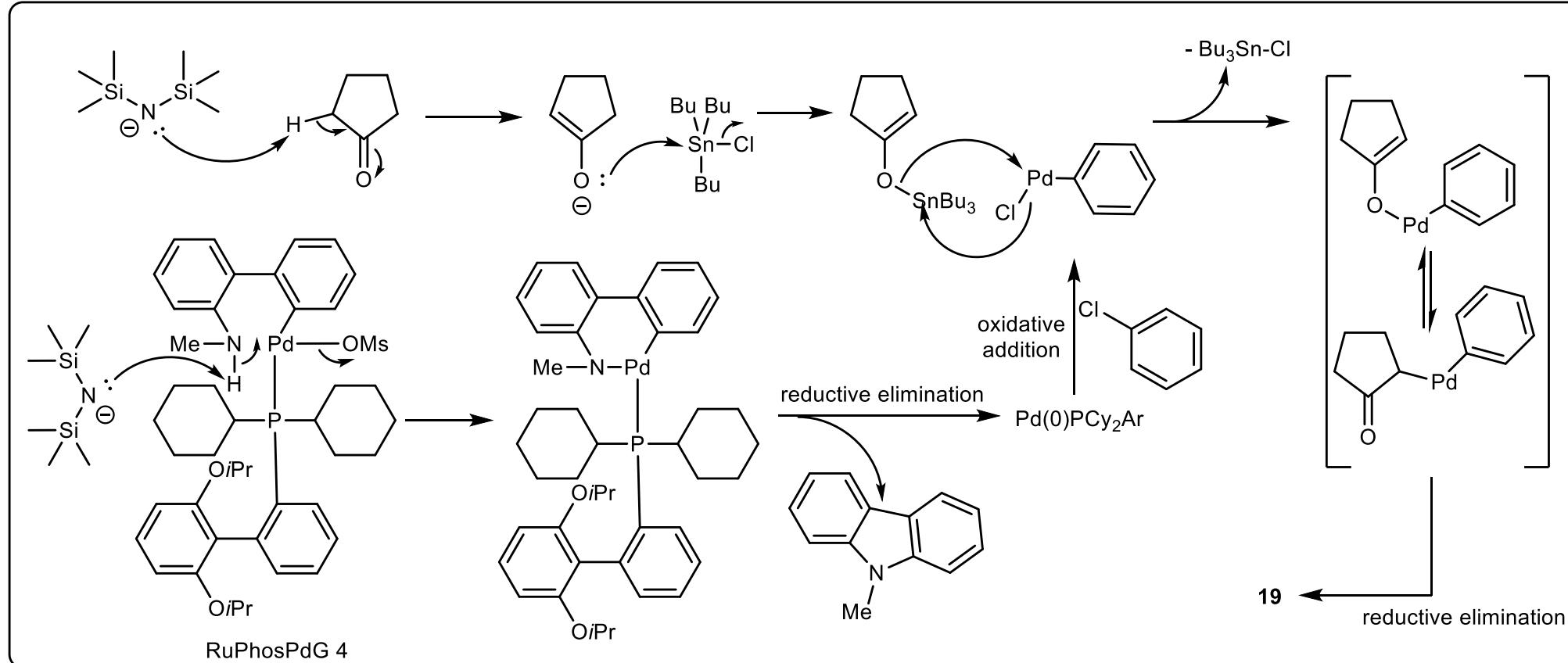
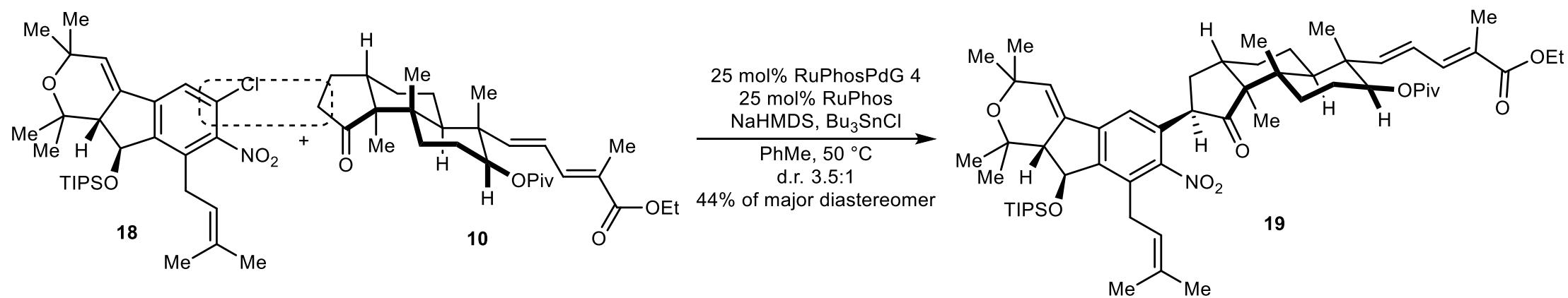
Synthesis of Indenopyran Fragment



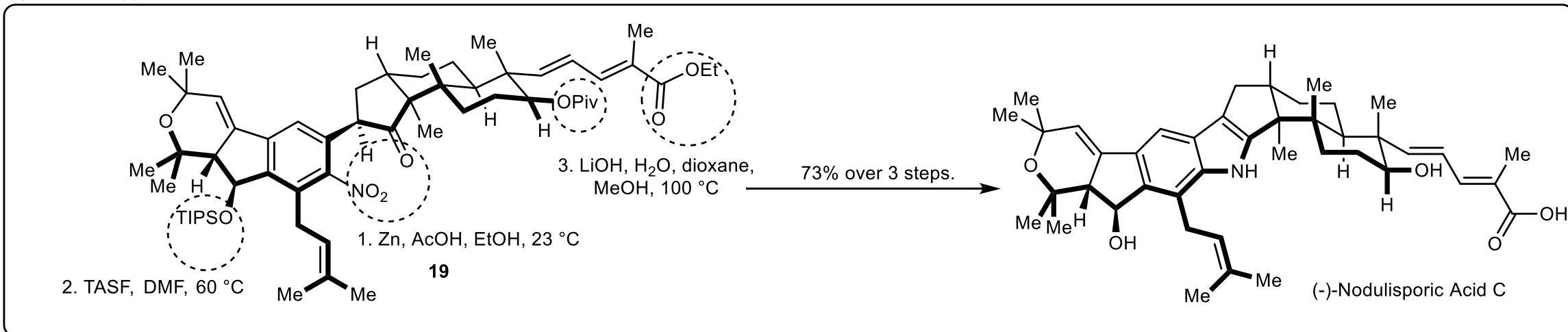
Synthesis of Indenopyran Fragment



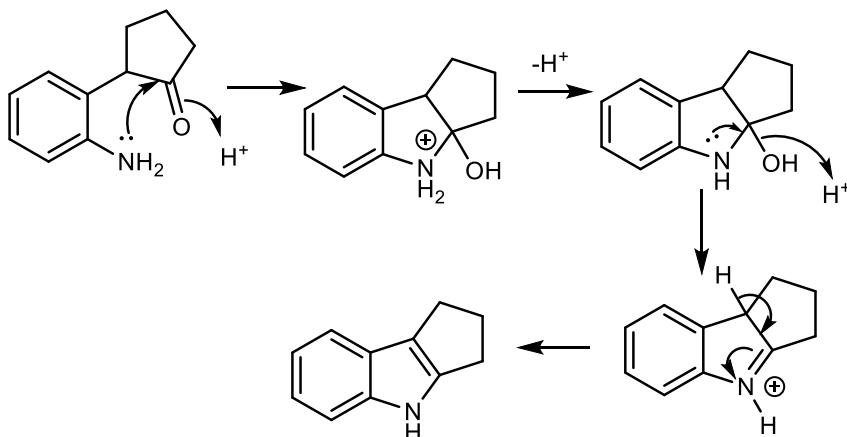
Synthesis of (-)-Nodulisporic acid C



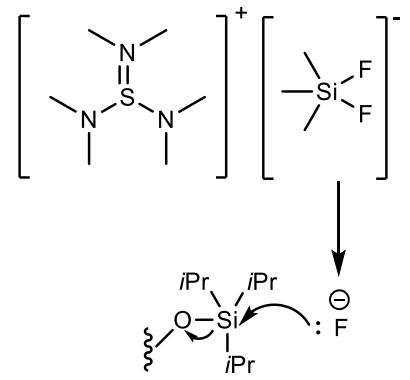
Synthesis of (-)-Nodulisporic acid C



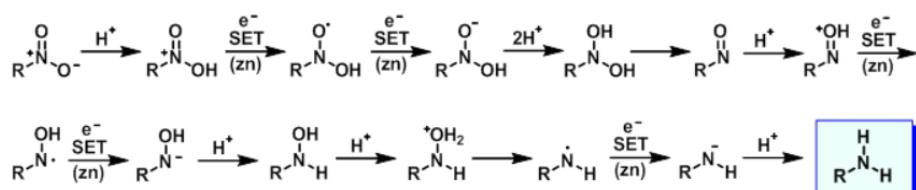
Mechanism of Indole Formation



TASF deprotection mechanism



Zn reduction of nitro group



ester hydrolysis

