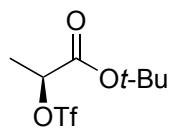
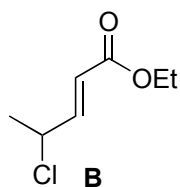
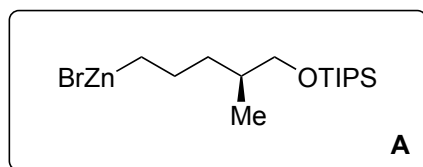


## Total Synthesis of Carolacton, a Highly Potent Biofilm Inhibitor

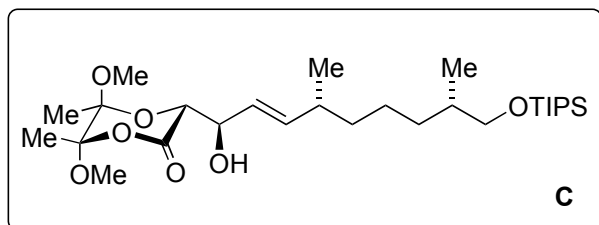
T. Schmidt, A. Kirschning, *Angew. Chem. Int. Ed.* **2012**, *51*, 1063–1066.



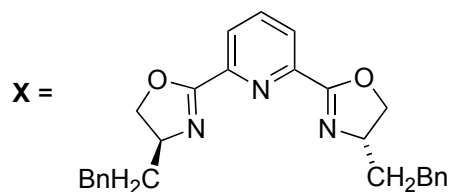
1 - 5



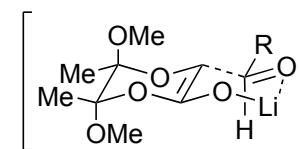
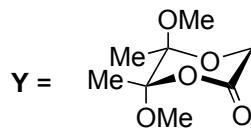
7 - 10



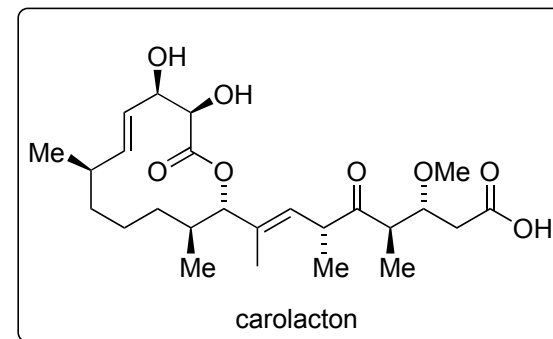
- 1)  $\text{ZnCl}_2$ , then  $\text{CH}_2=\text{CHCH}_2\text{MgCl}$
- 2)  $\text{LiAlH}_4$
- 3) TIPSCl, imidazole
- 4)  $\text{O}_3$ , then  $\text{NaBH}_4$
- 5) 2,6-lutidine,  $\text{PPh}_3$ ,  $\text{CBr}_4$
- 6)  $\text{Zn}$ ,  $\text{I}_2$



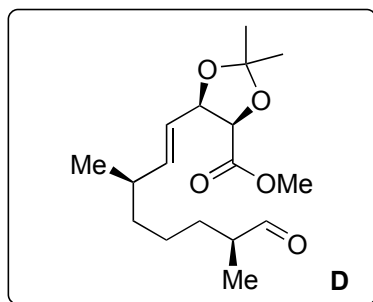
- 7)  $\text{NiCl}_2$ -glyme, **X**,  $\text{NaCl}$ , then **B**, then **A**
- 8) DIBAL-H
- 9)  $\text{MnO}_2$
- 10) **Y**, LHMDS



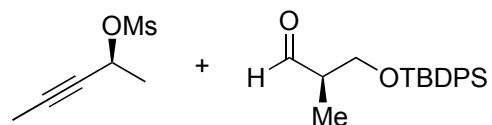
Step 10: Name of the reaction? Draw a transition state! Ley aldol reaction



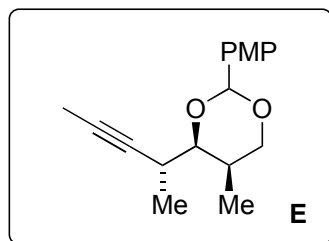
11 - 13



- 11) CSA, MeOH
- 12) 2,2-dimethoxypropane, PPTS
- 13) (COCl)<sub>2</sub>, DMSO, Et<sub>3</sub>N



14 - 16

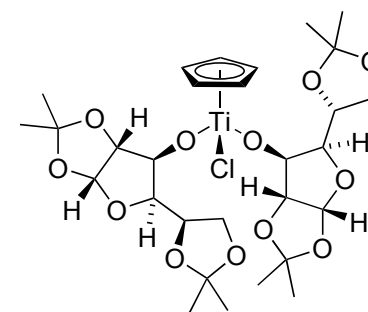


- 14) InI, Pd(dppf)Cl<sub>2</sub>·CH<sub>2</sub>Cl<sub>2</sub>
- 15) TBAF
- 16) 4-methoxybenzaldehyde dimethyl acetale, PPTS

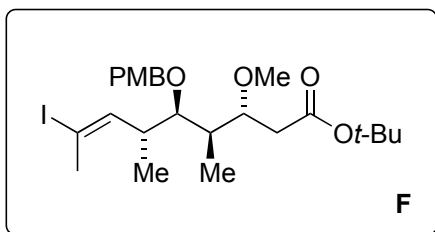
17 - 21

- 17) DIBAL-H
- 18) (COCl)<sub>2</sub>, DMSO, NEt<sub>3</sub>
- 19) *t*-butyl acetate, LDA, Ti-complex
- 20) Me<sub>3</sub>OBf<sub>4</sub>, proton sponge
- 21) [Cp<sub>2</sub>ZrClH], then I<sub>2</sub>

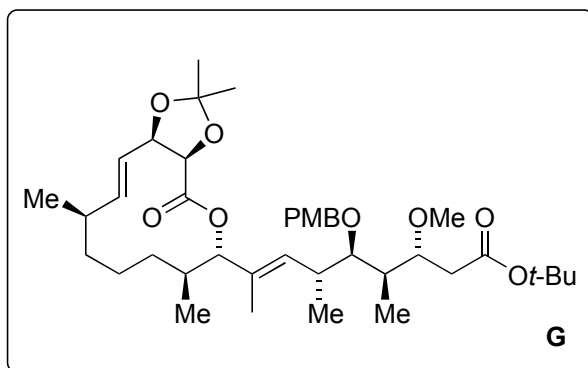
Step 14: Name of the reaction?  
Provide a mechanism!



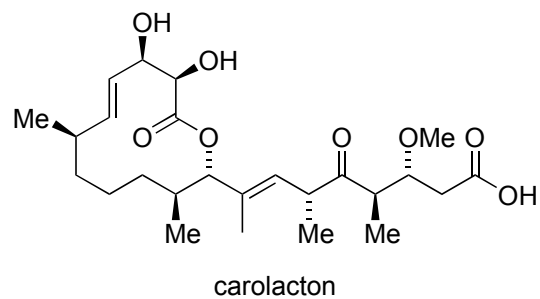
Step 19: Name of the reaction!  
Duthaler-Hafner aldol reaction



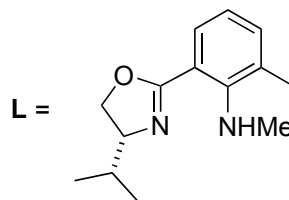
22 - 24



25 - 27



22)  $\text{CrCl}_2$ , **L**, proton sponge, then  $\text{NiCl}_2(\text{dppp})$ , **D**, **F**  
 23) 1M LiOH  
 24) MNBA, DMAP



25) TESOTf, 2,6-lutidine, then TBAF  
 26) DDQ, then DMP  
 27) PPTS

**Mechanism of step 14: Marshall reaction**

