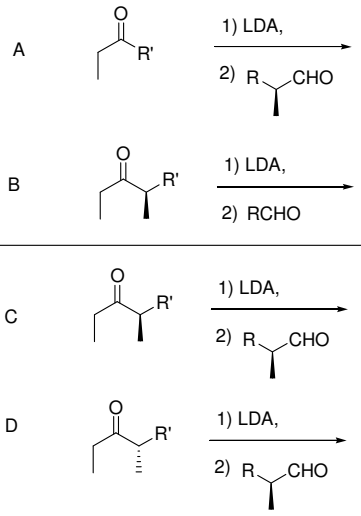
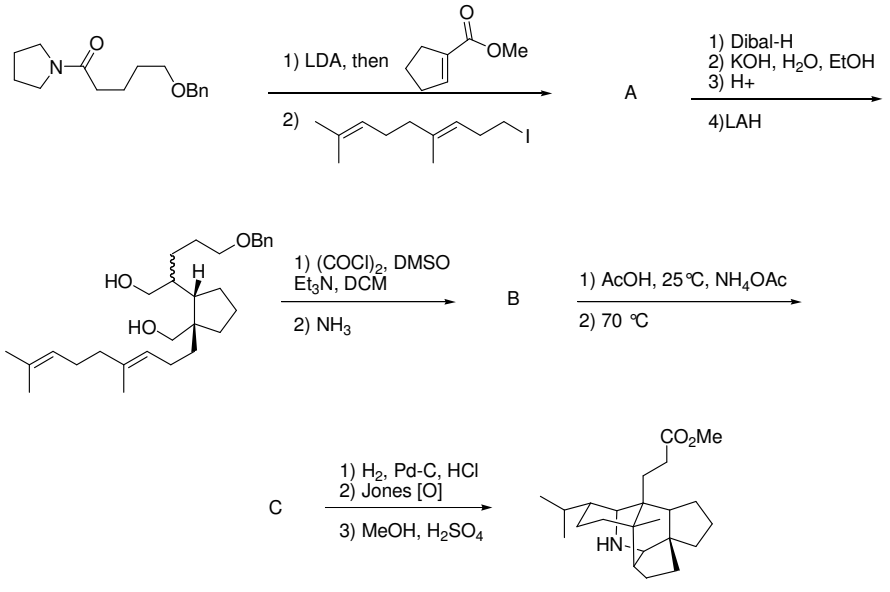
Michael R. Luzung
04/05/06

Clayton H. Heathcock

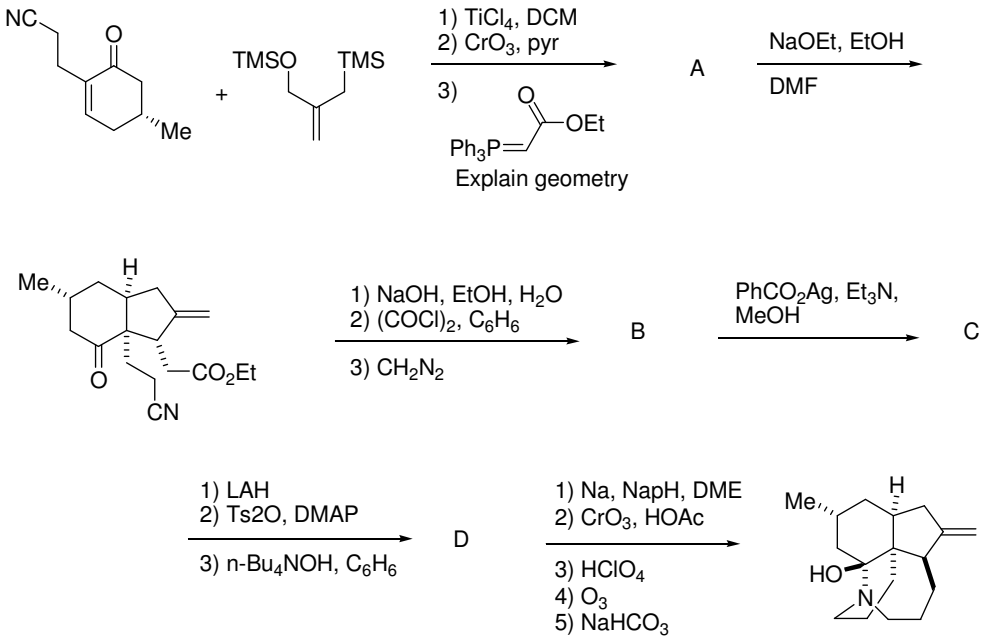
1. Clayton was responsible for working out and rationalizing the diasteroselectivity of lithium enolate aldol reactions. Below are a set of aldols. Please provide the products (under kinetic control…what happens under thermodynamic control?). Determine the major diastereomers. What will happen with the diastereoselection in C? What if the enantiomer of the enolate is used (in D)?



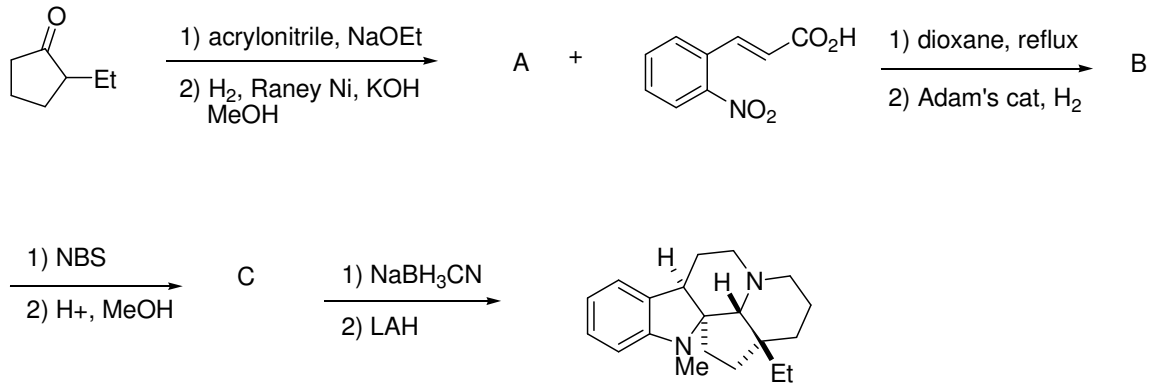
2. His group was also one of the first to coin the phrase "biomimetic synthesis." The total synthesis of methyl homosecodaphniphyllate demonstrates this. Follow along.



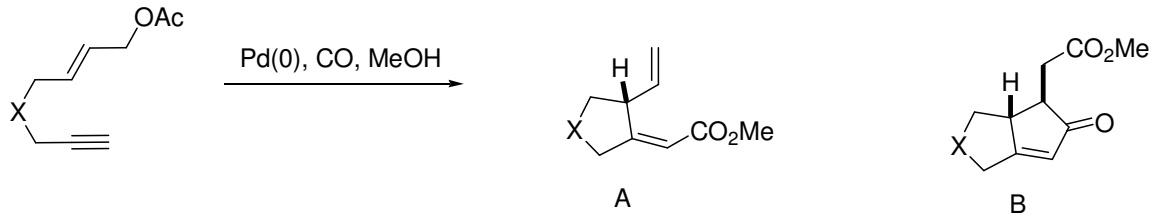
3. Here is the total synthesis of (±)-fawcettimine. Notice that there are no protecting groups used.

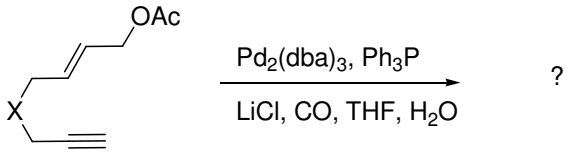


4. Another short synthesis of vallesamidine.



5. Clayton also worked on some Pd chemistry. Below is a carbonylation reaction. He wanted to synthesize A instead of B (B was developed by Oppolzer). First, provide a mechanism for both products. After a variety of attempts, they found another product. What is it? Provide a mechanism.





6. Dean said more road maps so here you are. Follow along to dethiadiscorhabdin D