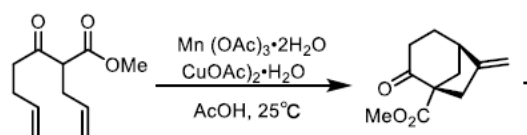


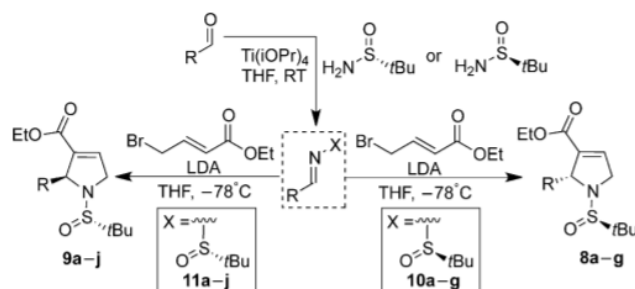
Part A

Please provide mechanisms for the following transformations.

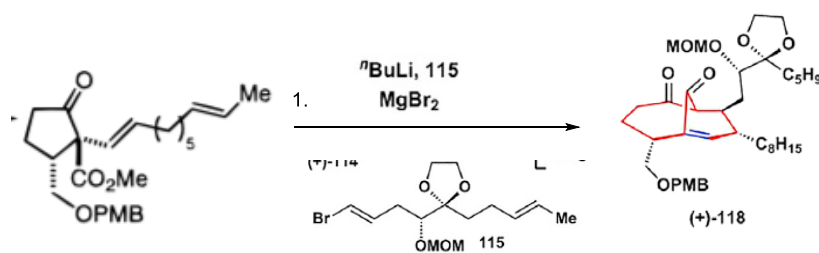
1)



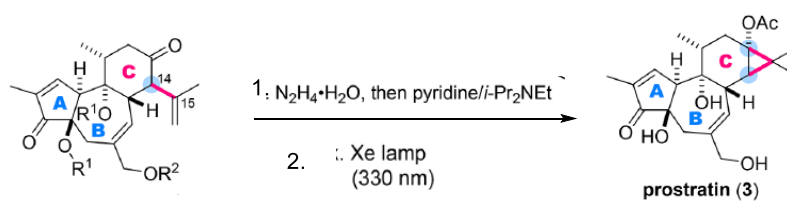
2)



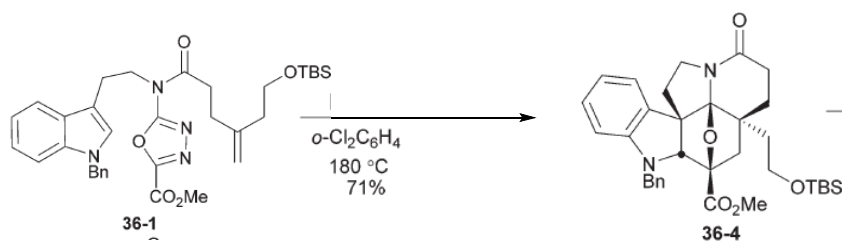
3)



4)



5)



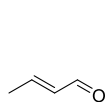
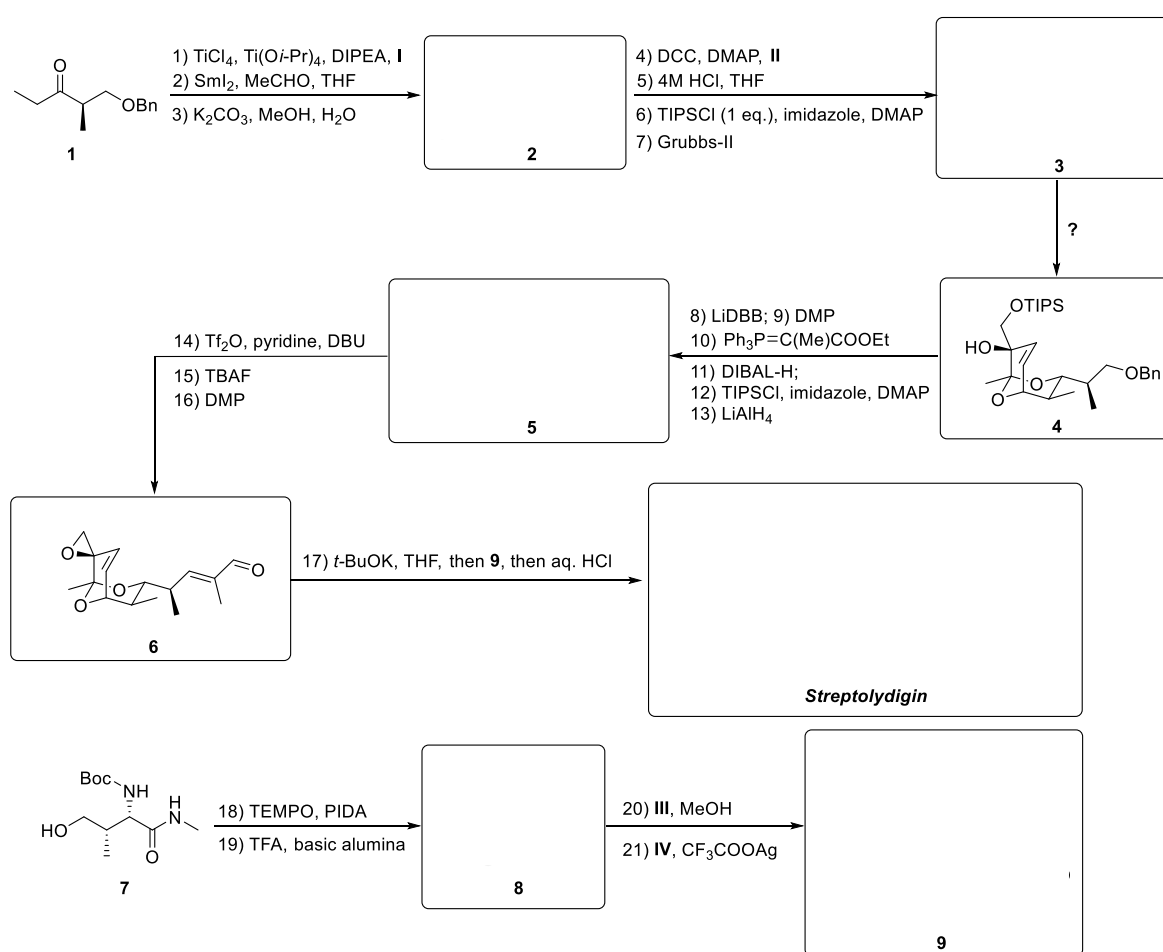
Part B

Happy New Year! As you might know, today is the Chinese New Year, and the Chinese zodiac gives each year an animal sign (within a loop of 12 animals). The animal of 2022 is tiger, so I've also picked quite arbitrarily some total synthesis works published in previous year of tiger. Have fun!

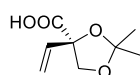
1. Synthesis of Streptolydigin, a Potent Bacterial RNA Polymerase Inhibitor

J. Am. Chem. Soc. **2010**, *132*, 14394–14396.

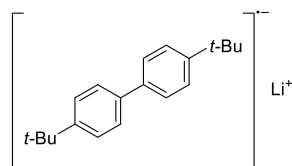
- 1) Please identify the missing structures.
- 2) Please explain the stereoselectivity from **1** to **2**.
- 3) Please suggest steps to convert **3** to **4**.
- 4) Please provide a mechanism for step 17 (**6** to **Streptolydigin**).



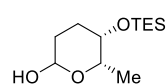
I



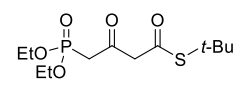
II



LiDBB



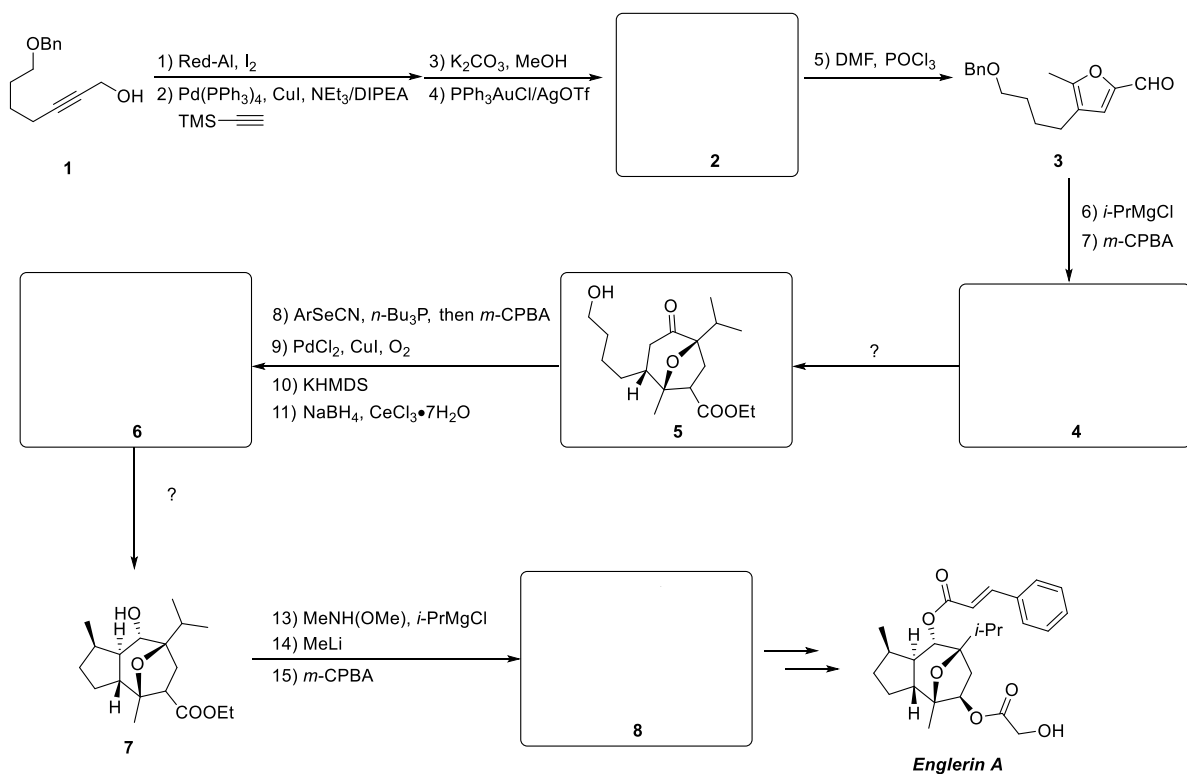
III



IV

2. Total Synthesis of Englerin A

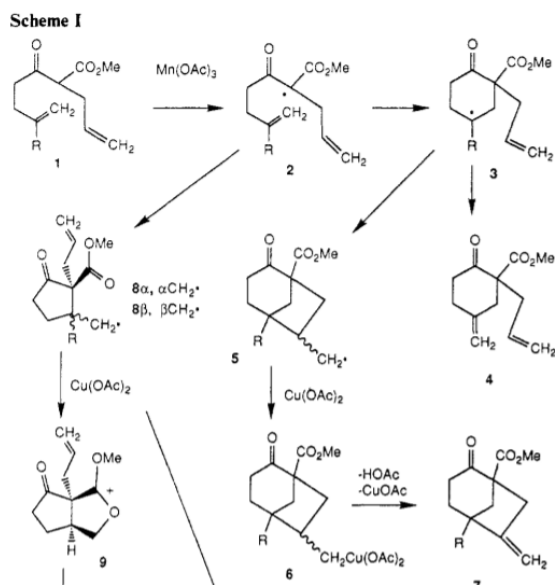
J. Am. Chem. Soc. **2010**, *132*, 8219–8222



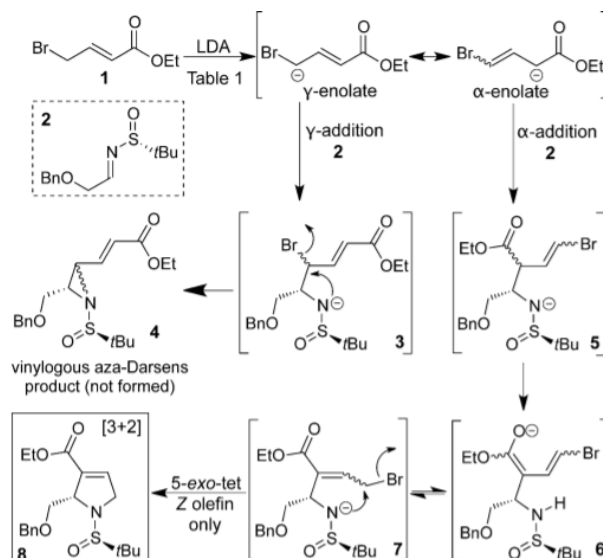
- 1) Please identify the missing structures.
- 2) Please suggest steps that convert 4 to 5.
- 3) Please provide proper reagent for converting 6 to 7.

Answers - Part A

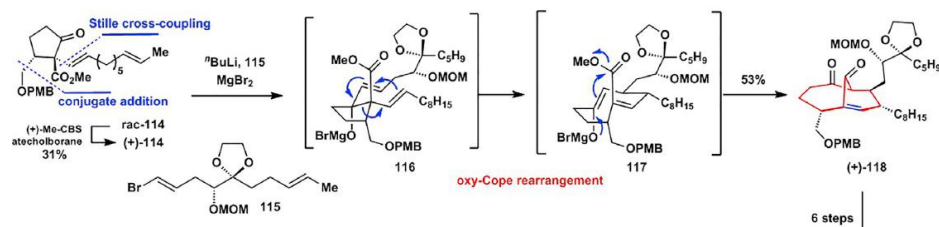
1. See *J. Am. Chem. Soc.* **1990**, *112*, 2759–2767



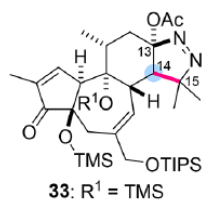
2. See *Angew. Chem. Int. Ed.* **2015**, *54*, 13706–13710



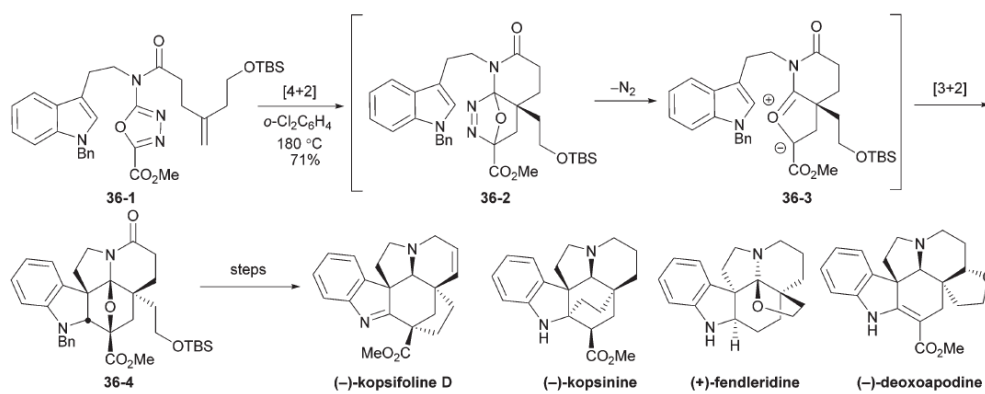
3. *J. Am. Chem. Soc.* **2000**, *122*, 7424–7425



4. See *Chem* 4, 2944–2954, December 13, **2018**; *J. Am. Chem. Soc.* **2021**, 143, 31, 12387–12396



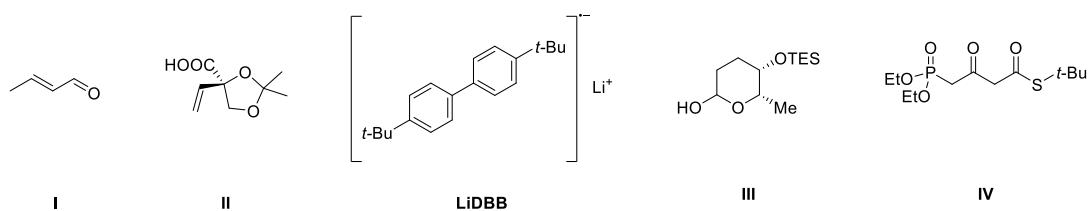
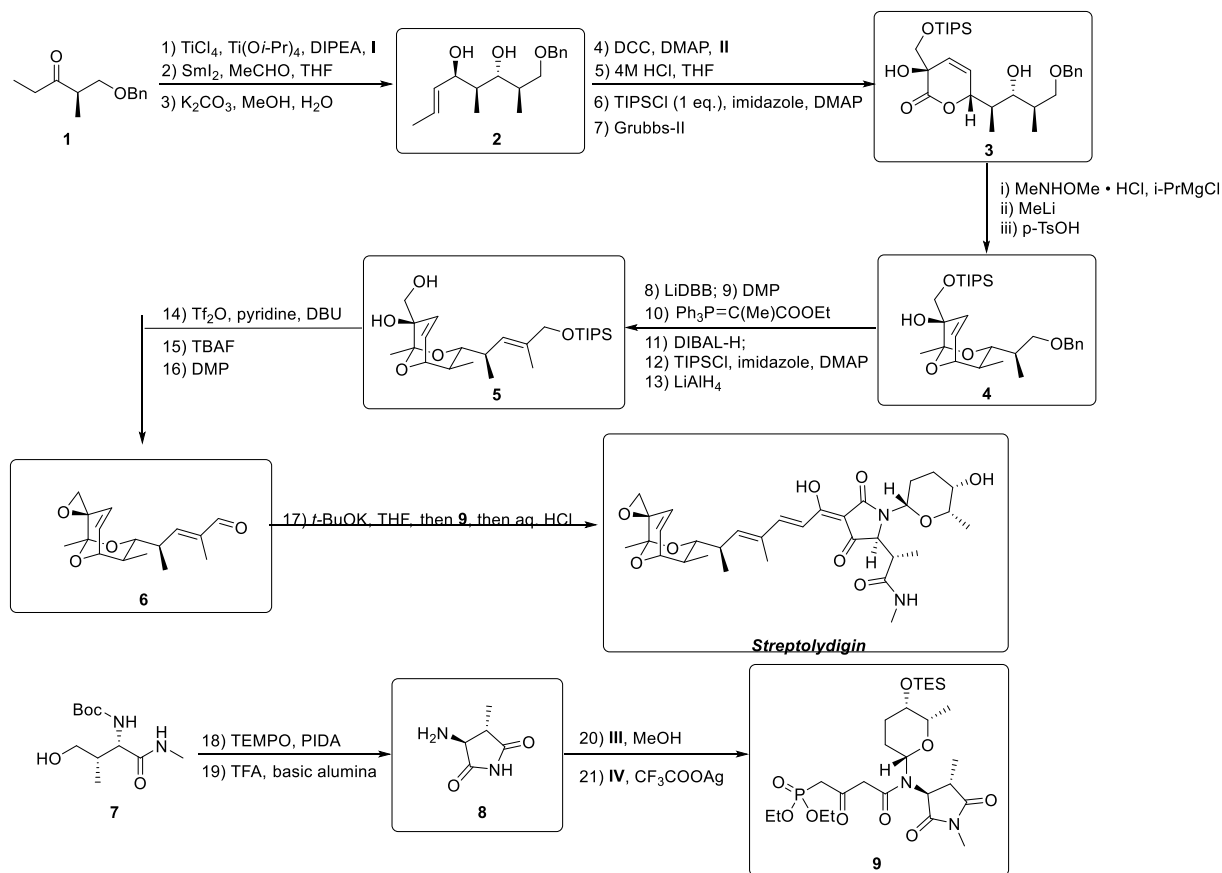
5. See *Org. Chem. Front.*, **2018**, 5, 864–892; *Acc. Chem. Res.*, **2016**, 49, 241.



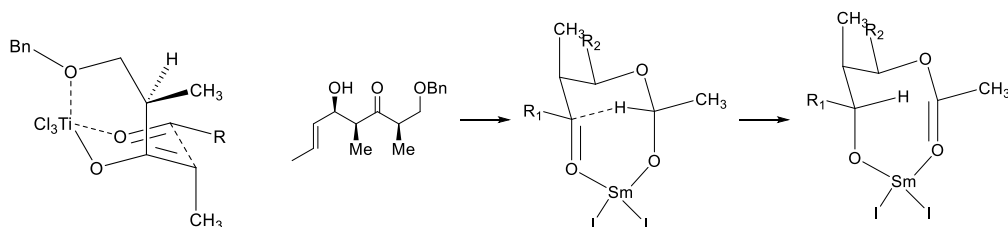
Answers - Part B

1. Synthesis of Streptolydigin, a Potent Bacterial RNA Polymerase Inhibitor

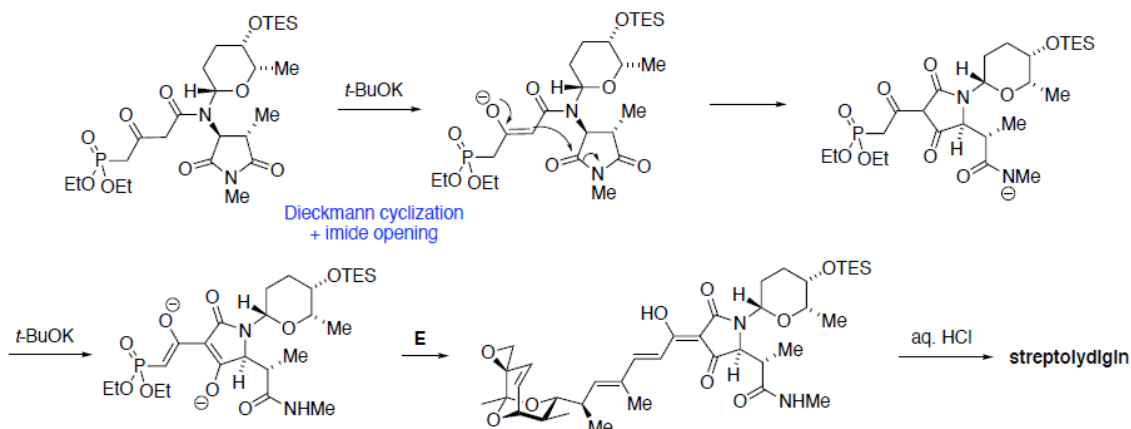
J. Am. Chem. Soc. **2010**, *132*, 14394–14396.



- Please identify the missing structures.
- Please explain the stereoselectivity from **1** to **2**.



- Please suggest steps to convert **3** to **4**.
- Please provide a mechanism for step 17 (**6** to *Streptolydigin*).



2. Total Synthesis of Englerin A

J. Am. Chem. Soc. **2010**, 132, 8219–8222

