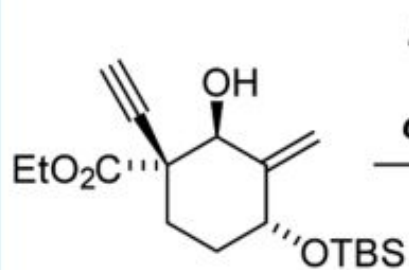
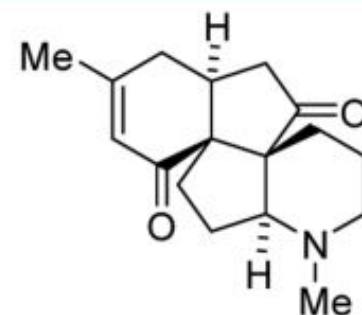
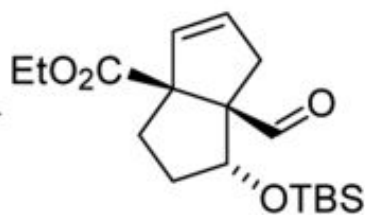


# Formal Total Synthesis of ( $\pm$ )-Lycojaponicum C

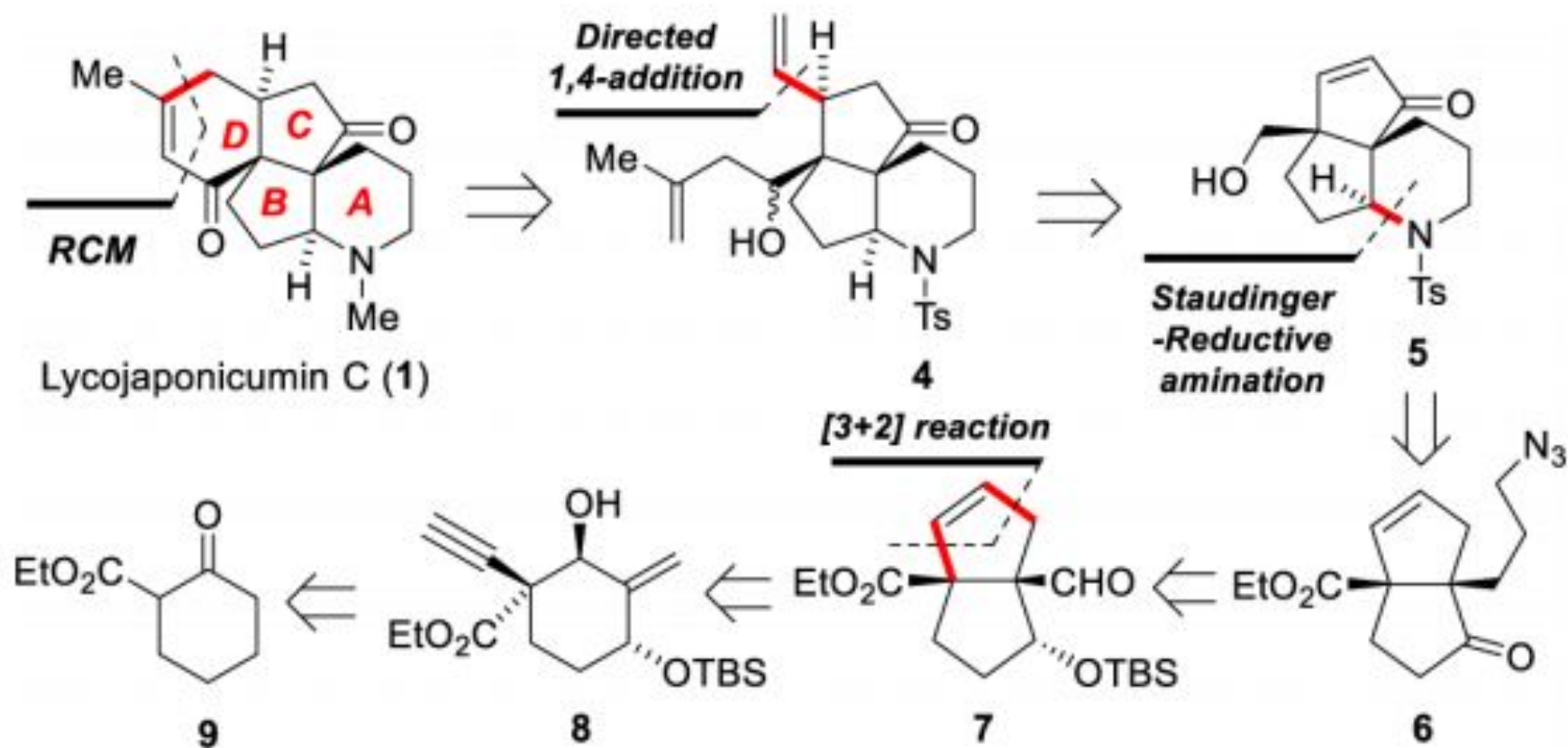


*Rh-catalyzed  
formal [3+2]  
cycloaddition*

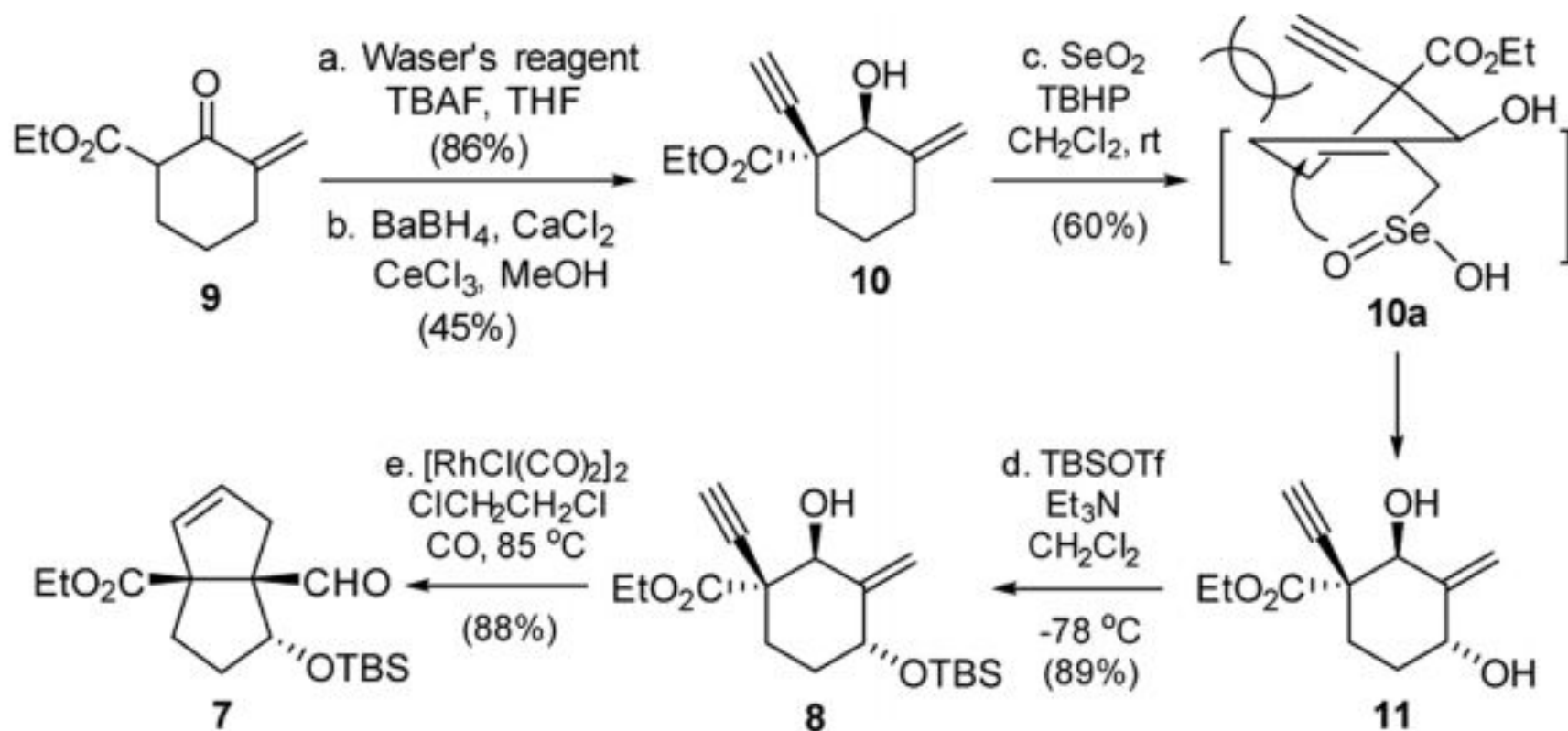


( $\pm$ )-Lycojaponicum C (**1**)

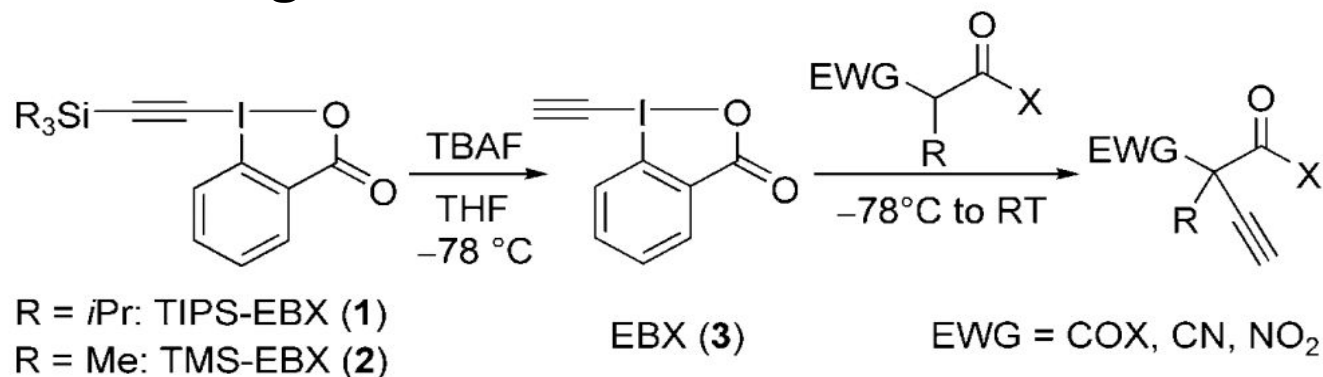
# Scheme 1. Retrosynthetic Analysis



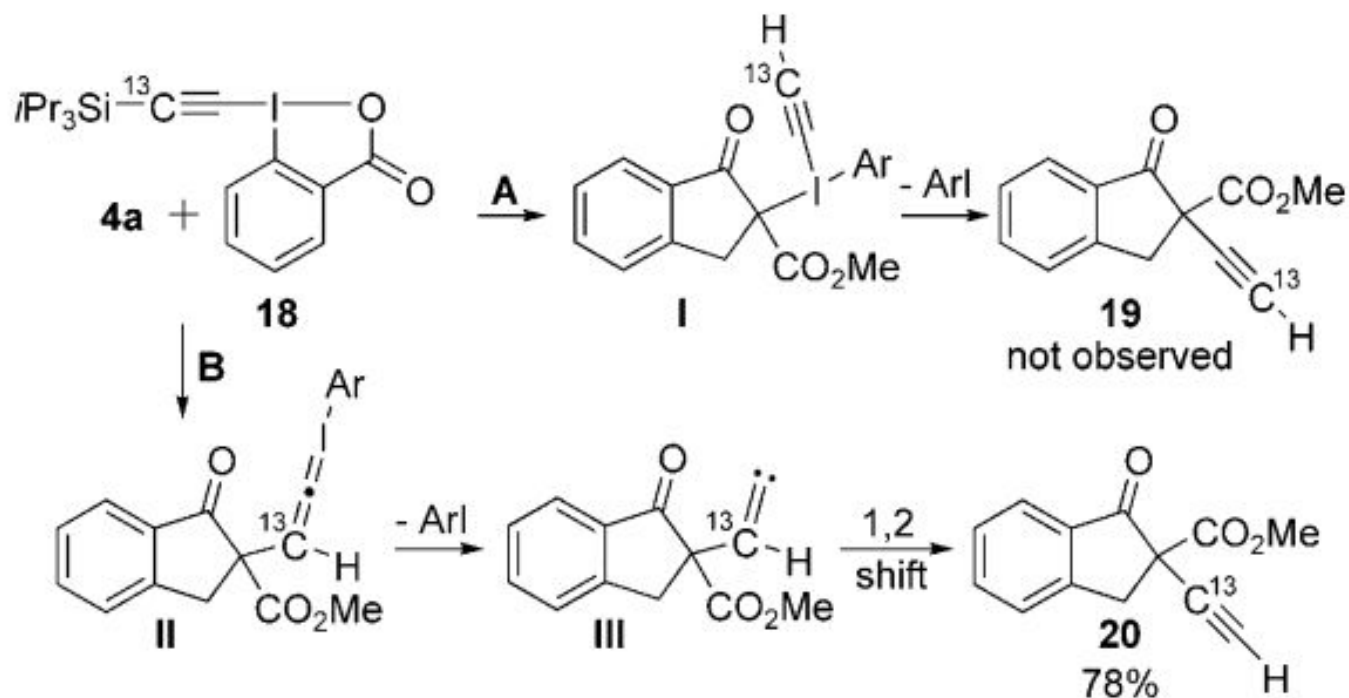
## Scheme 2. Synthesis of the Bicyclic Framework 7 with Two Vicinal Quaternary Carbon Centers



# Waser's reagent



Scheme 1. Alkynylation of soft enolates with EBX (3).

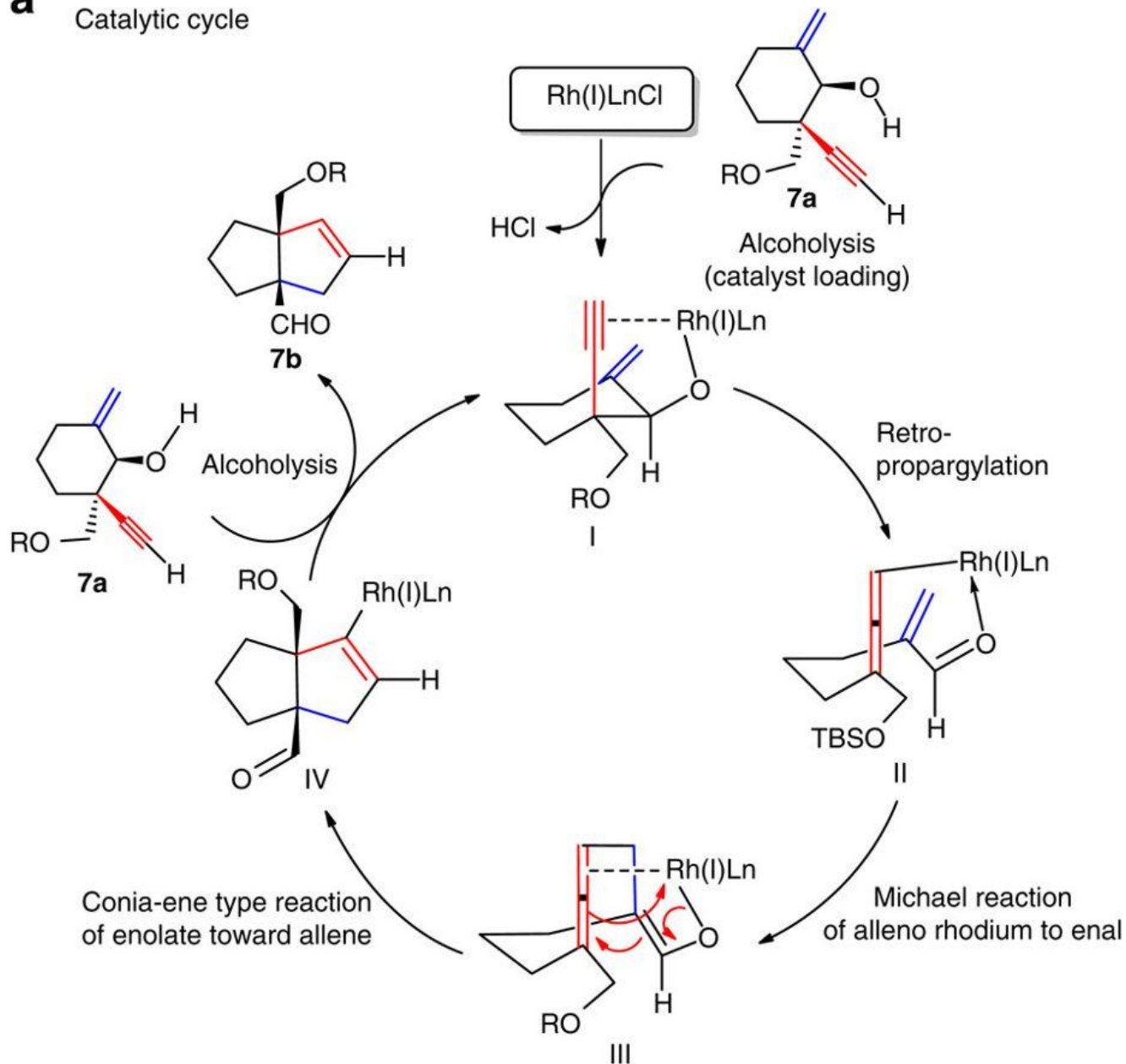


Scheme 3. Possible mechanisms for the ethynylation reaction and labeling experiment (Ar = phenyl-2-carboxylate).

<https://doi.org/10.1002/chem.201001539>

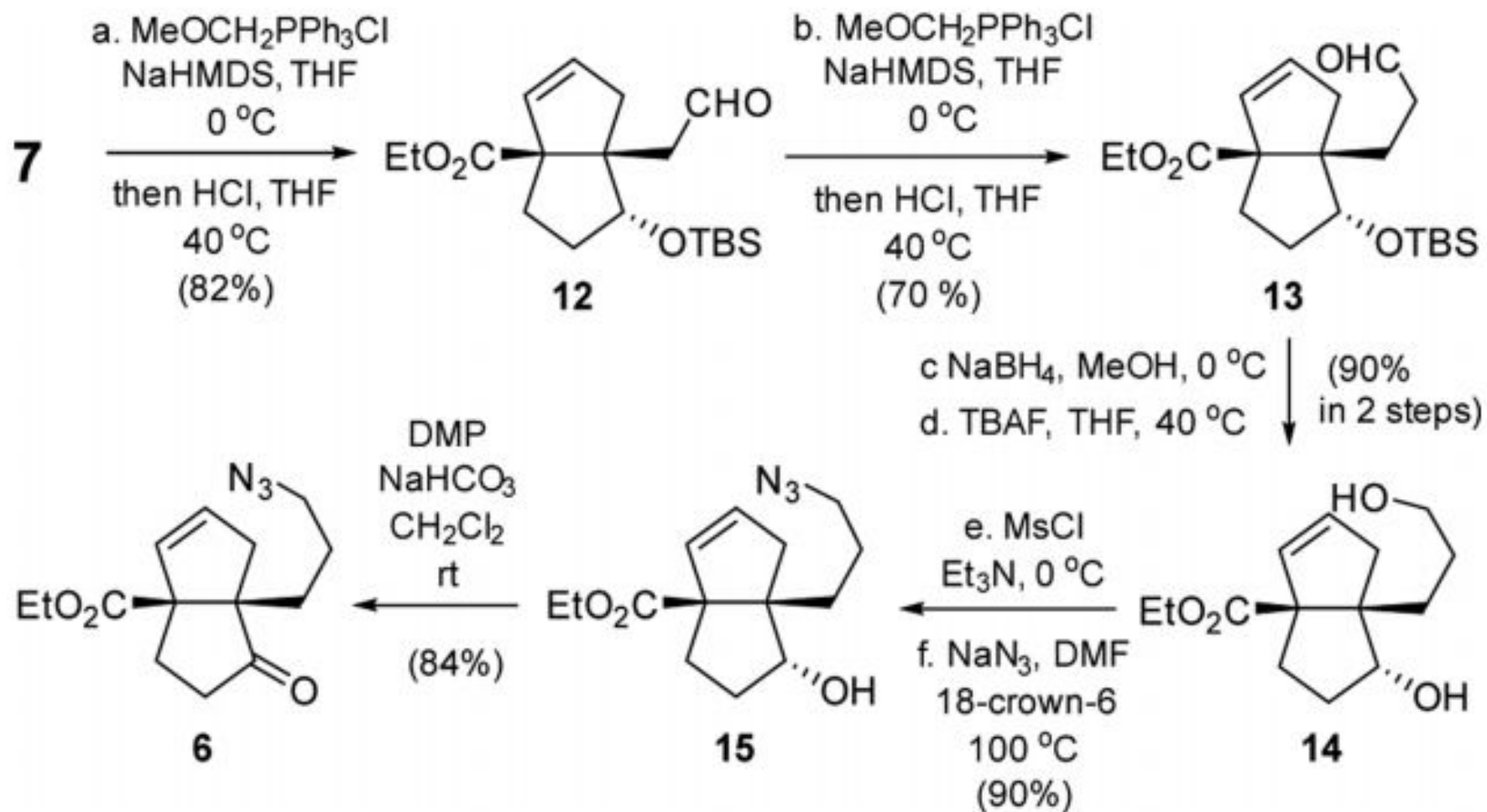
**a**

## Catalytic cycle



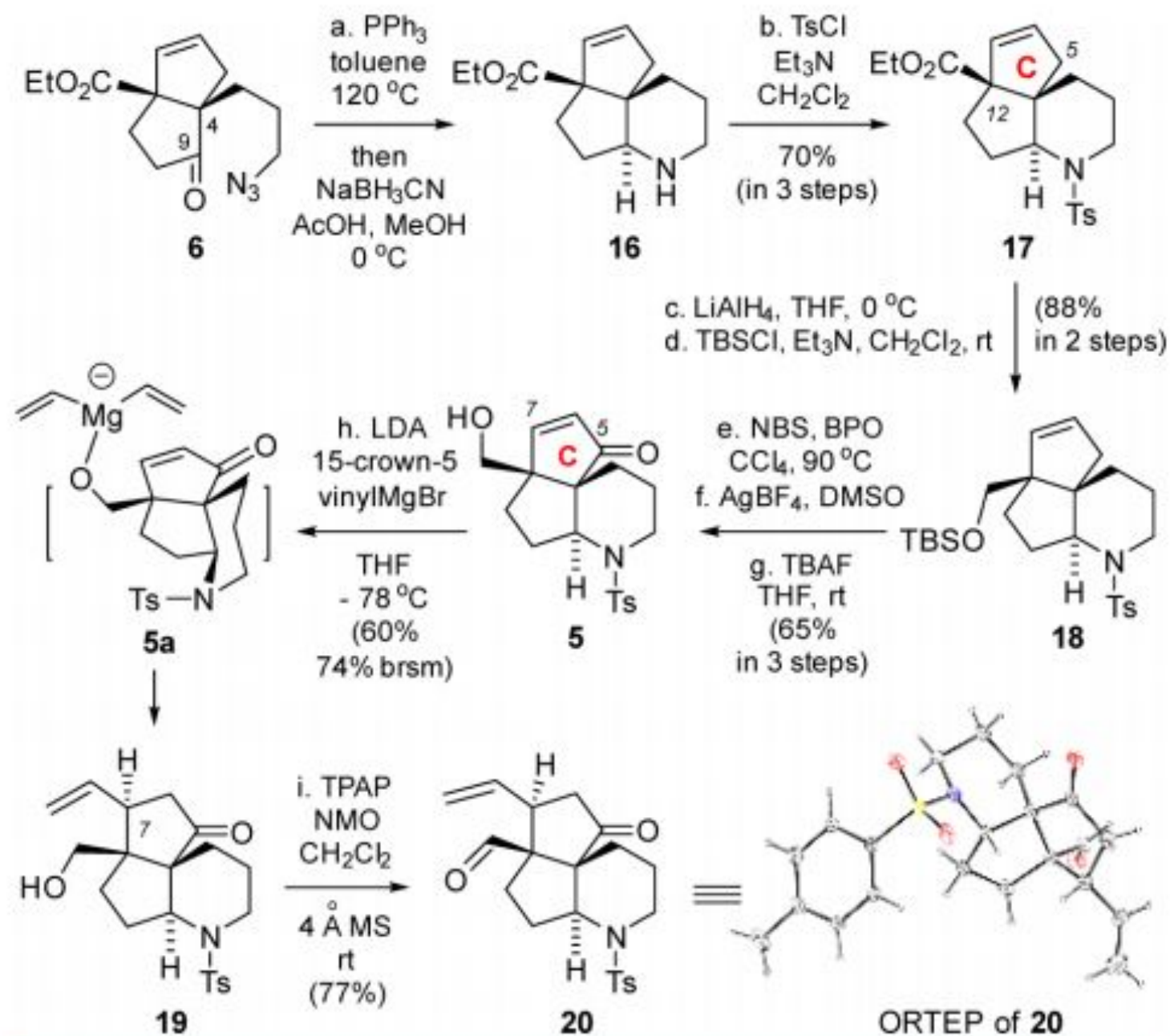
<https://www.nature.com/articles/ncomms6707>

### Scheme 3. Introduction of the Nitrogen Functionality





# Scheme 4. Synthesis of Compound 20

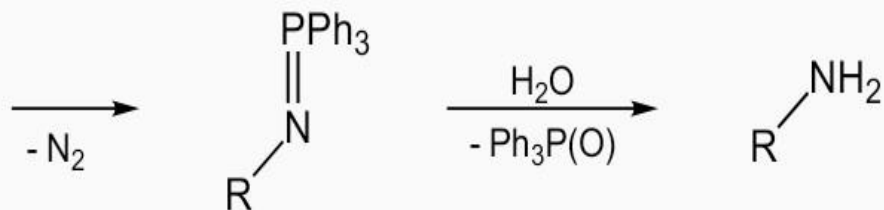
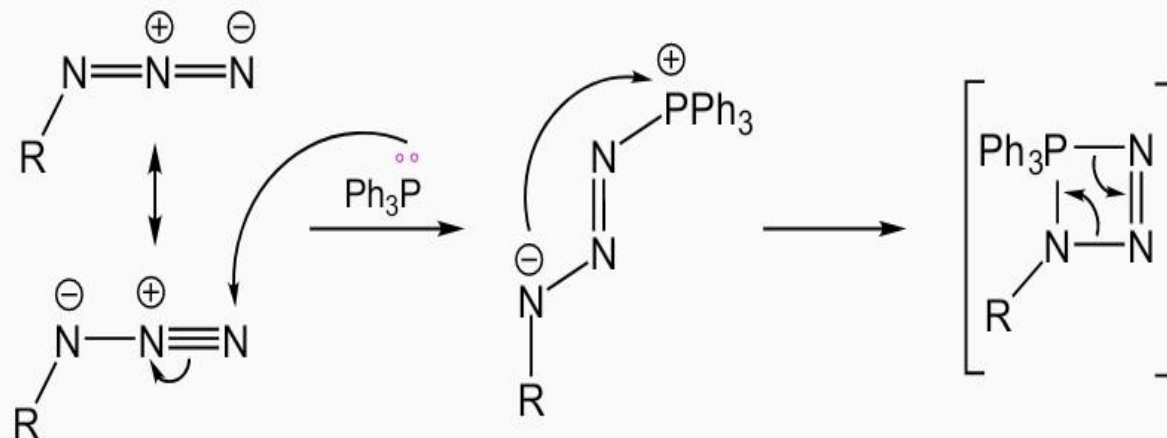




# Staudinger Azide Reduction



Mild reduction of an azide to an amine by phosphine or phosphite



by Reaxys®

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## Scheme 5. Formal Synthesis of ( $\pm$ )-Lycojaponicum C

