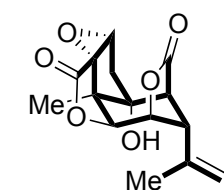


Synthesis of (-)-picrotoxinin from (R)-carvone - exploration of C-C bond construction

— C-C bond forming — C-C bond breaking

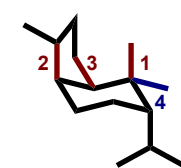


(-)-picrotoxinin

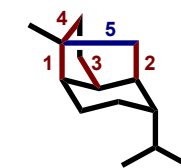
Main reference from R. Shenvi: *J. Am. Chem. Soc.* **2020**, *142*, 26, 11376-11381
 Corey: *J. Am. Chem. Soc.* **1979**, *101*, 5841-5843
 Trost: *J. Am. Chem. Soc.* **1999**, *121*, 6183-6192
 Yamada: *J. Am. Chem. Soc.* **1984**, *106*, 4547-4552
 Yosikoshi: *J. Am. Chem. Soc.* **1989**, *111*, 3728-3734

- Isolated by Pierre François Guillaume Boullay in 1812
- Found in the fruit of *Anamirta cocculus*
- Highly toxic: LD₅₀ = 3.0 mg/kg
- GABA antagonist in synapses
- Inhibits opening of Cl⁻ ion channels

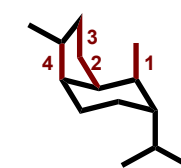
Shenvi (11 steps)



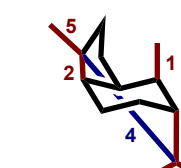
Corey (19 steps)



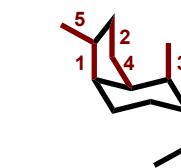
Trost (24 steps)



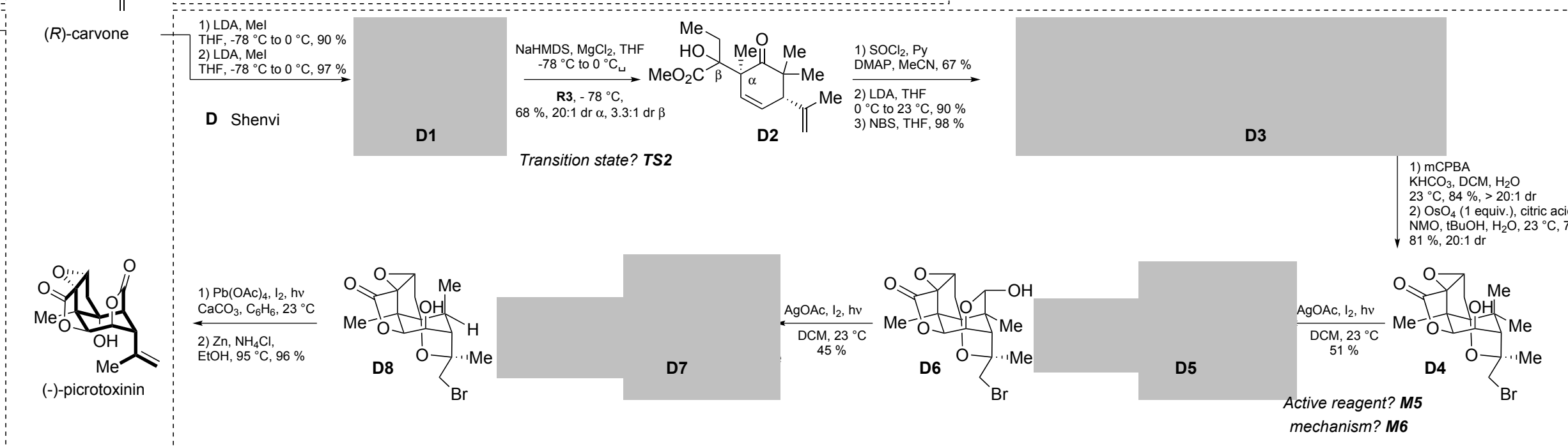
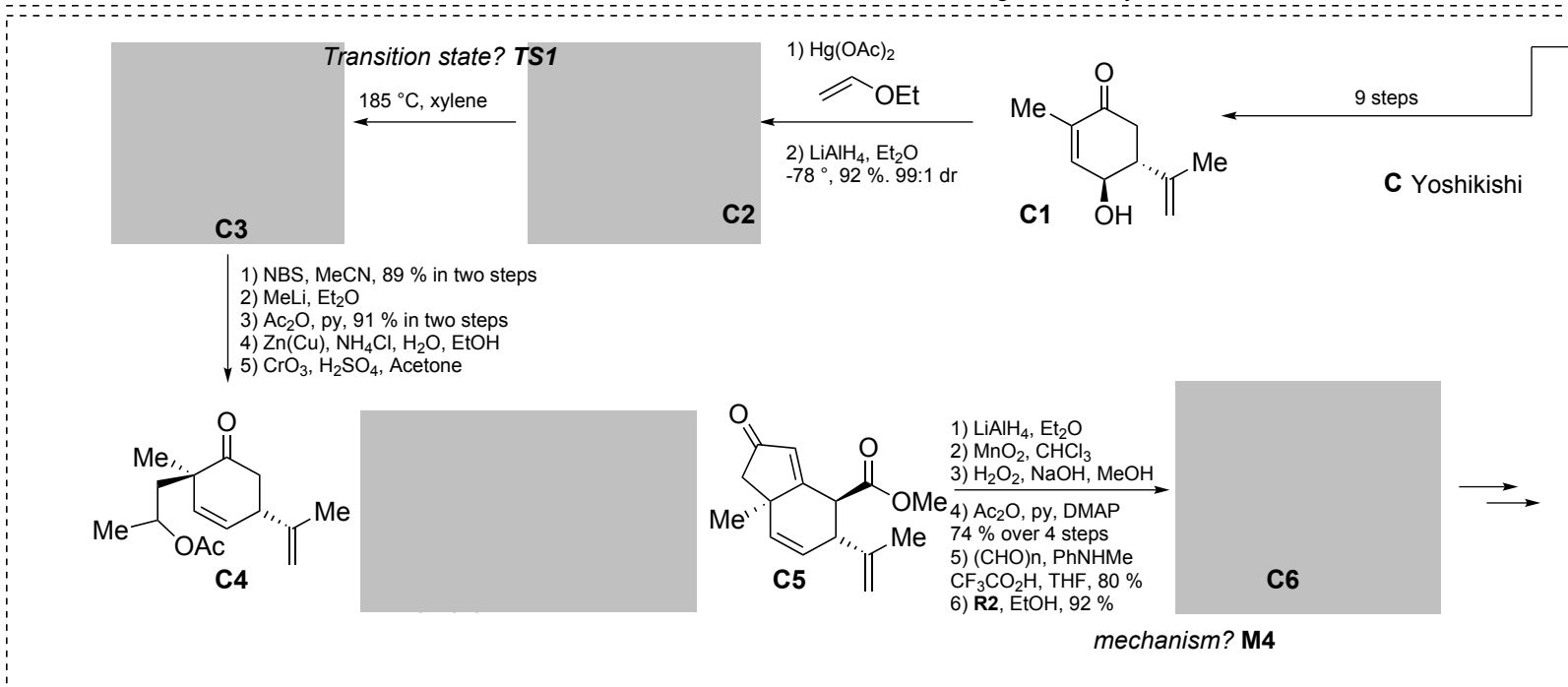
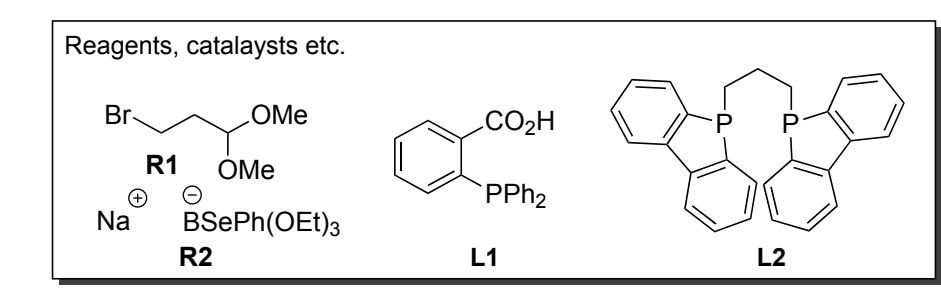
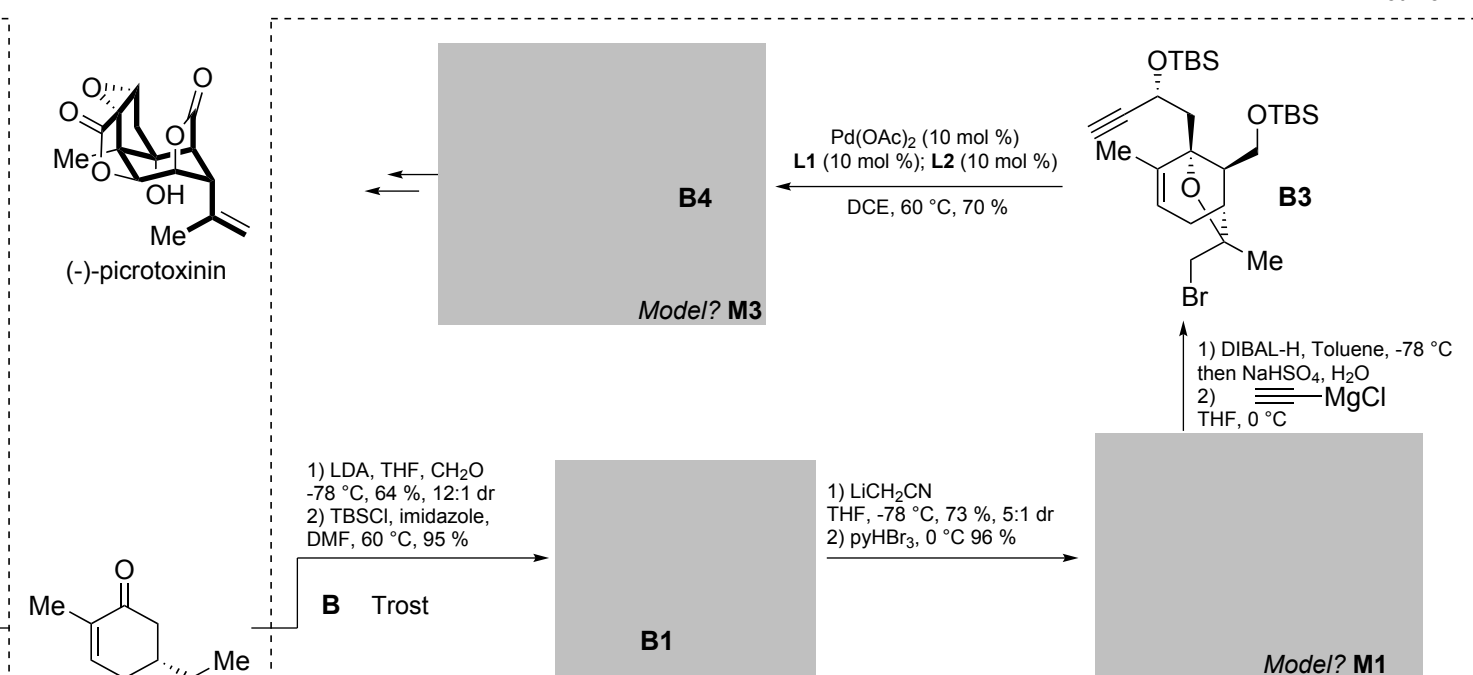
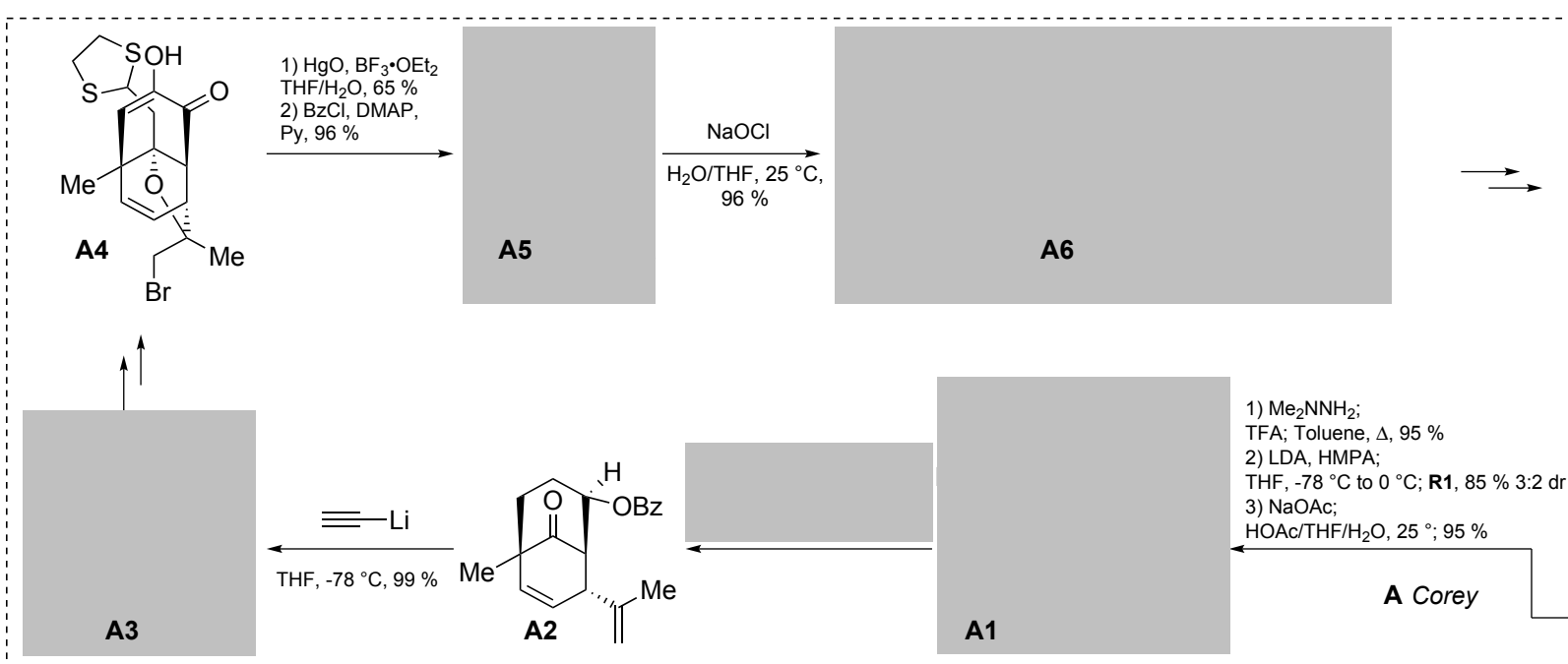
Yamada (36 steps)



Yosikoshi (40 steps)



not from carvone



Transition states, mechanisms etc.

M1, M2, M3, M4, M5, M6, TS1, TS2