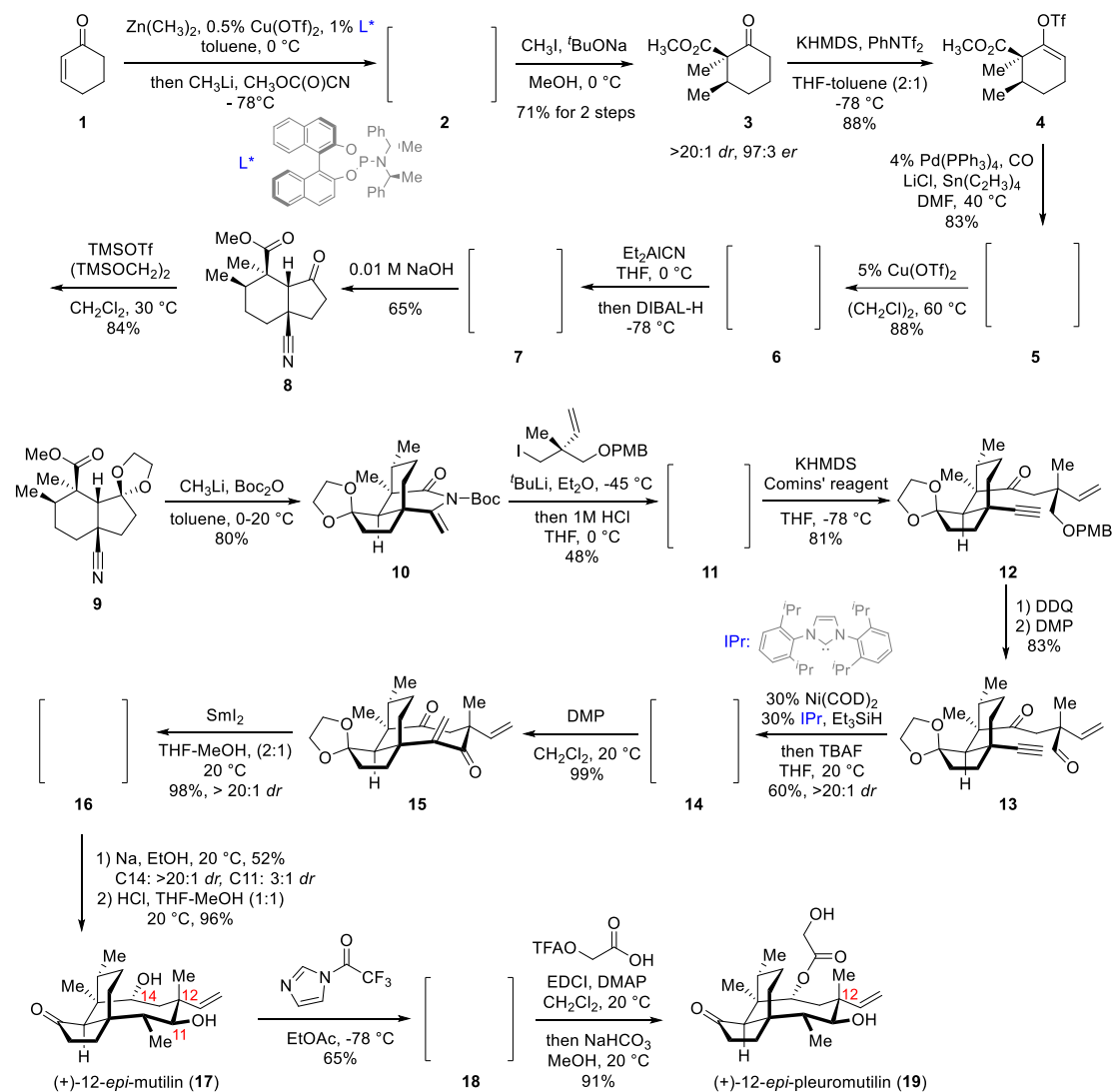


(+)-Pleuromutilin (**34**) is a diterpene natural product first isolated from the fungus *Clitopilus passeckerianus* in 1951. Some derivatives of (+)-pleuromutilin have been identified as potent antibiotics, for example, retapamulin is an FDA-approved topical antibiotic. Very recently, Luo group has reported the total synthesis of (+)-mutilin ([doi: org/10.1021/jacs.2c06934](https://doi.org/10.1021/jacs.2c06934)). And there were also some other very elegant synthetic routes before this. Here I selected two total synthesis which I think we could have some fun. So try to understand every step and figure out the structures in blank brackets and give the corresponding mechanisms.

Herzon group in 2017:



Reisman group in 2018:

