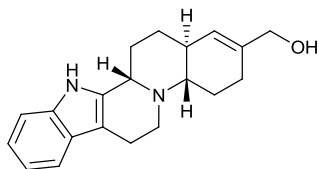


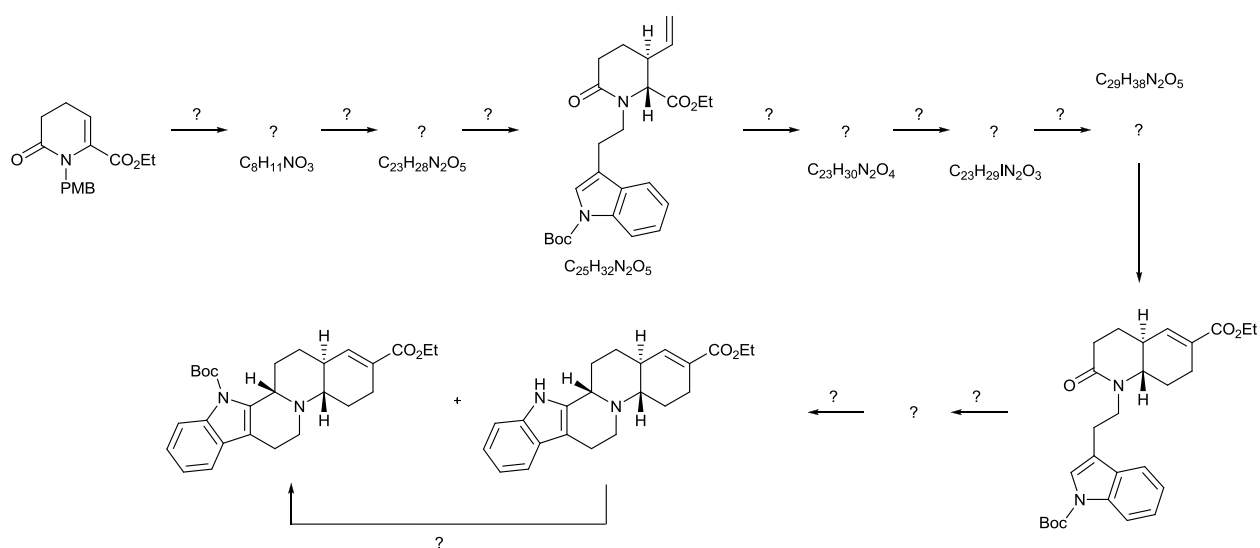
Total synthesis of the monoterpene alkaloid (±)-tangutorine



(±)-tangutorine

In 1999, a novel racemic β -carboline named tangutorine was isolated by Duan and colleagues from the leaves of the Chinese medical plant : *Nitraria tangutorine*. Tangutorine shows interesting biological effects on the regulation of cell cycle and cellular morphology and therefore might serve as a lead compound for the design of new drugs.

Find out all intermediates and reagents. What is the name of the reaction giving the pentacyclic system ? For this reaction two types of mechanisms appear in literature (one involving an imine-ester intermediate, and one involving a nitrilium intermediate), give the appropriated one.



Reagents and conditions :

