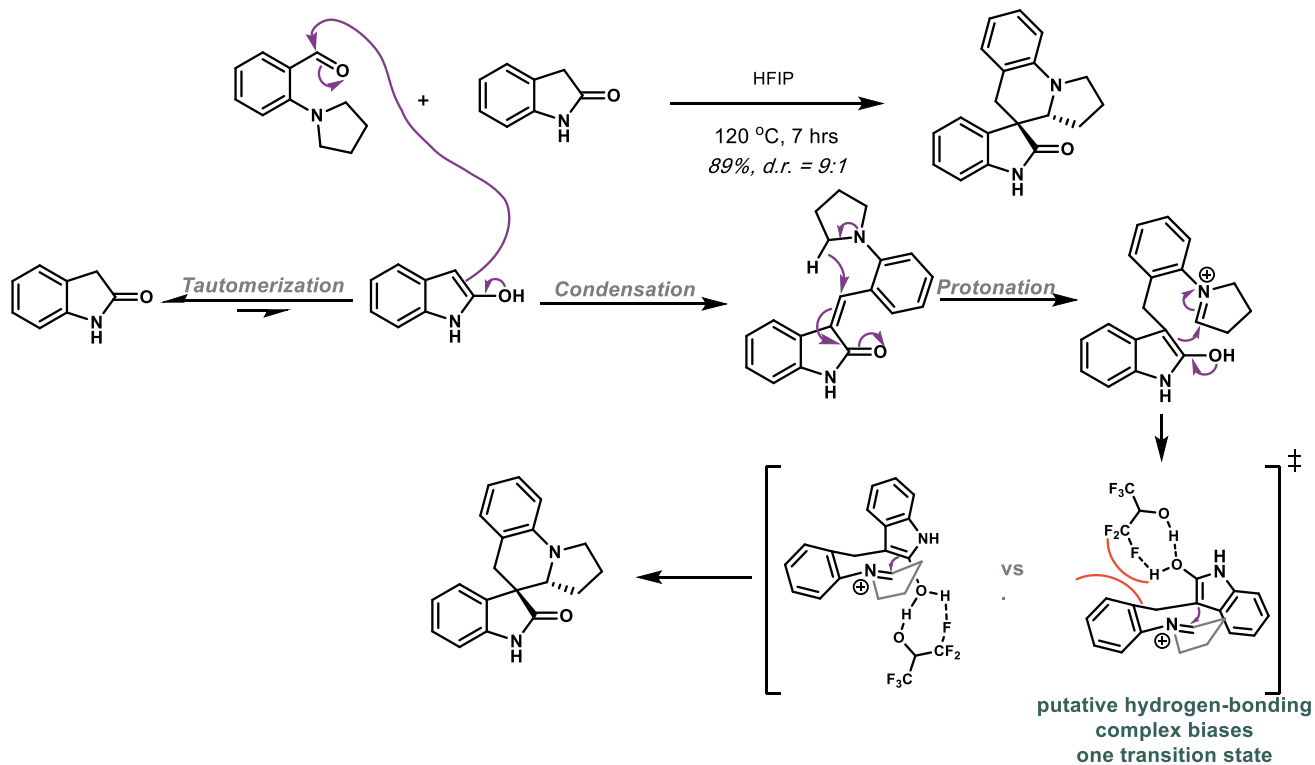


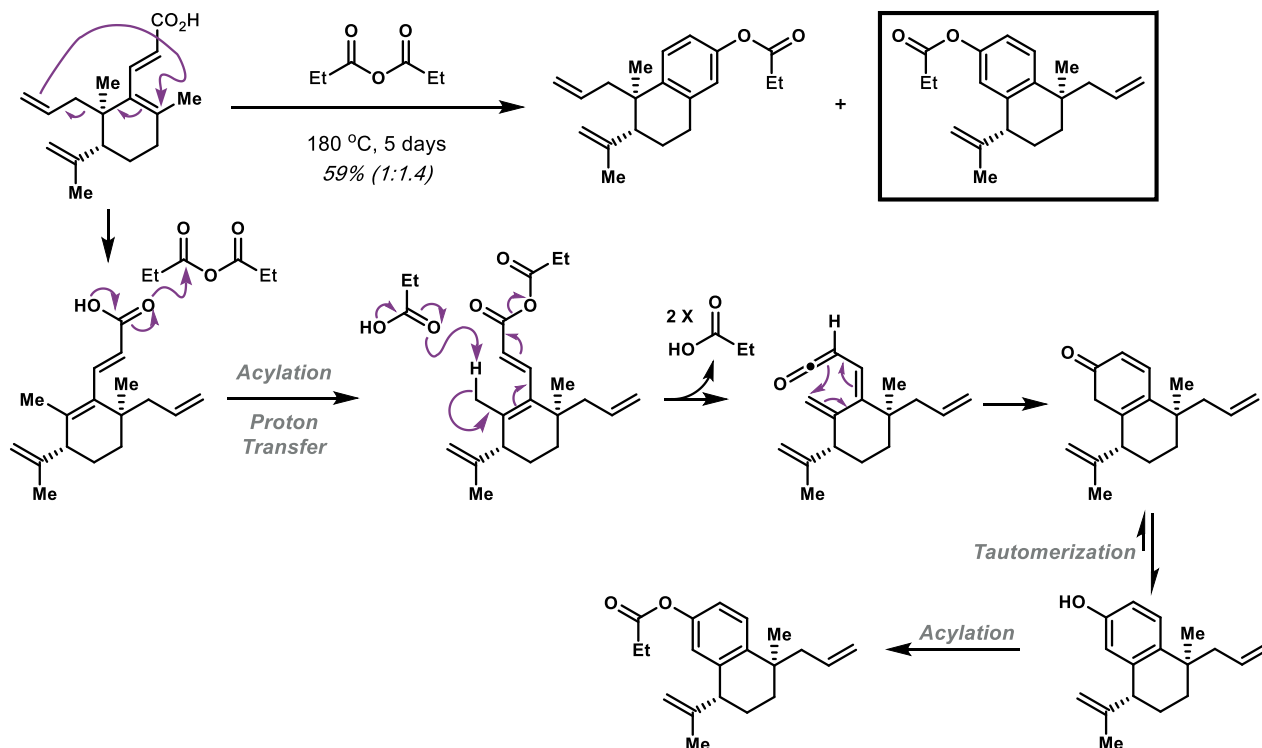
3, 2, 1... Shift Off!

1. Provide a mechanism for the following transformation. Can you account for the observed diastereoselectivity?
Wang, Li, *Org. Biomol. Chem.*, 2018, 16, 7109



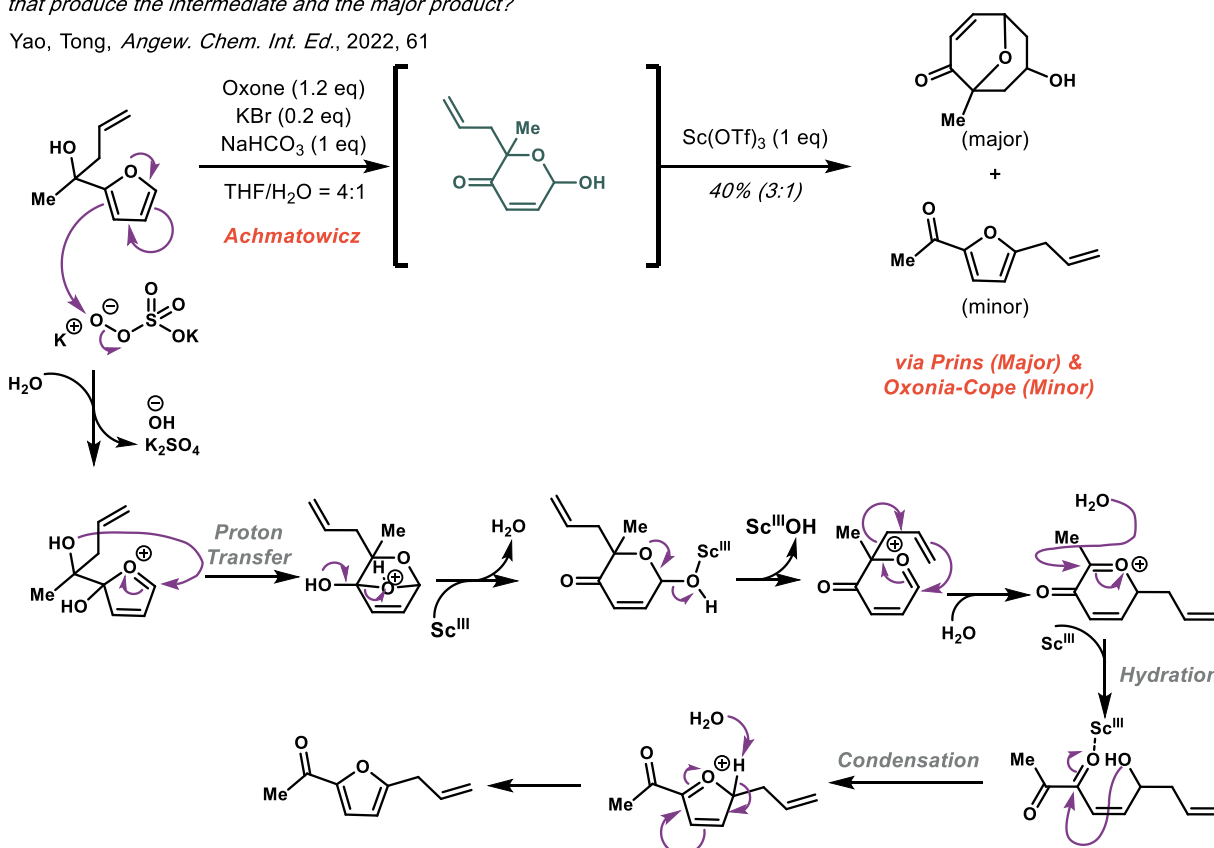
2. En route to their synthesis of crotogoudin, Sarpong and coworkers observed the formation of an undesired side product when they heated the acid below in propionic anhydride. Provide a mechanism that accounts for the formation of this side product.

Sarpong, *J. Am. Chem. Soc.*, 2017, 139, 11349



3a. Yao, Tong and coworkers observed a minor and unexpected product from the following transformation. Provide the structure of the intermediate in brackets and a mechanism for the formation of the minor product. What are the names of the reactions that produce the intermediate and the major product?

Yao, Tong, *Angew. Chem. Int. Ed.*, 2022, 61



3b. Is the formation of the minor product possible by directly heating the starting material or treating it with base? Why or why not?

No, the [3,5]-sigmatropic rearrangement with 8 electrons is suprafacially forbidden according to the Woodward-Hoffman rule.