

Ph.D. Seminar Title

Sequential Enantioselective Iridium-Catalyzed Allylic Alkylation/Cope Rearrangement for Construction of Acyclic γ -Stereocenters

The catalytic asymmetric functionalization of carbonyl derivatives at the remote γ -position is challenging because of the issues with controlling chemo- (O vs. C), regioselectivity (α vs. γ), and enantioselectivity at a remote position. In recent years, enantioselective transition metal-catalyzed γ -allylic alkylation reactions have attracted increasing attention, albeit they are typically restricted to cyclic pronucleophiles. A general strategy to regio- and stereoselectively produce acyclic γ -allylic substituted carbonyl derivatives is underdeveloped, especially for constructing quaternary stereocenters. The seminar will outline the development of two enantioselective iridium-catalyzed γ -allylic alkylation of acyclic nucleophiles to address this challenging problem. This work efficiently combines an enantioselective iridium-catalyzed allylic alkylation with a stereospecific Cope rearrangement. Additionally, these reactions are remarkably tolerant of a range of acyclic substituents, and the synthetic utility is demonstrated through conversion towards a series of related carbonyl derivatives that contain acyclic β - and γ -tertiary and quaternary stereocenters.

