Group Web Link

General Modular and Convergent Approach to Diversely Functionalized Allylic Systems

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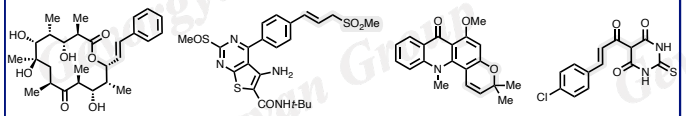
Abstract

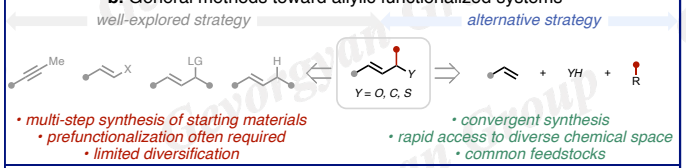
A modular and general method for the synthesis of allylic C–O, C–C, and C–S bond-containing motifs using visible-light-induced palladium catalysis was developed. This method enables the direct coupling of simple alkenes, readily available 1,1-dielectrophiles, and commercially available nucleophiles in a sequential manner to construct structurally diverse and medicinally relevant molecules. In contrast to classical Tsuji–Trost type protocols, this approach eliminates the need for pre-functionalized substrates, thereby enhancing synthetic efficiency and scope. Importantly, it overcomes longstanding challenges associated with oxygen-, carbon-, and sulfur-based nucleophiles, providing a unified platform for the streamlined synthesis of allylic ethers, esters, sulfones, and alkylated derivatives. Additionally, It shows excellent stereocontrol with unsymmetric substrates, enabling asymmetric allylic sulfonylation and alkylation reactions that extend the scope of this method beyond classical substrate-specific approaches.

Background

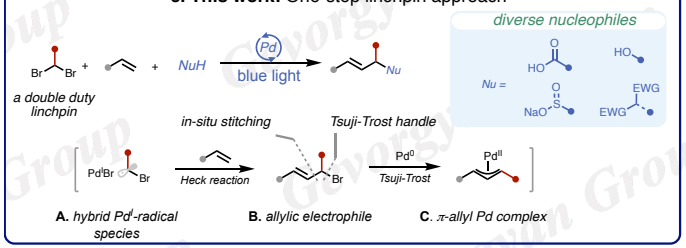
a. Bioactive allylic substituents



b. General methods toward allylic functionalized systems

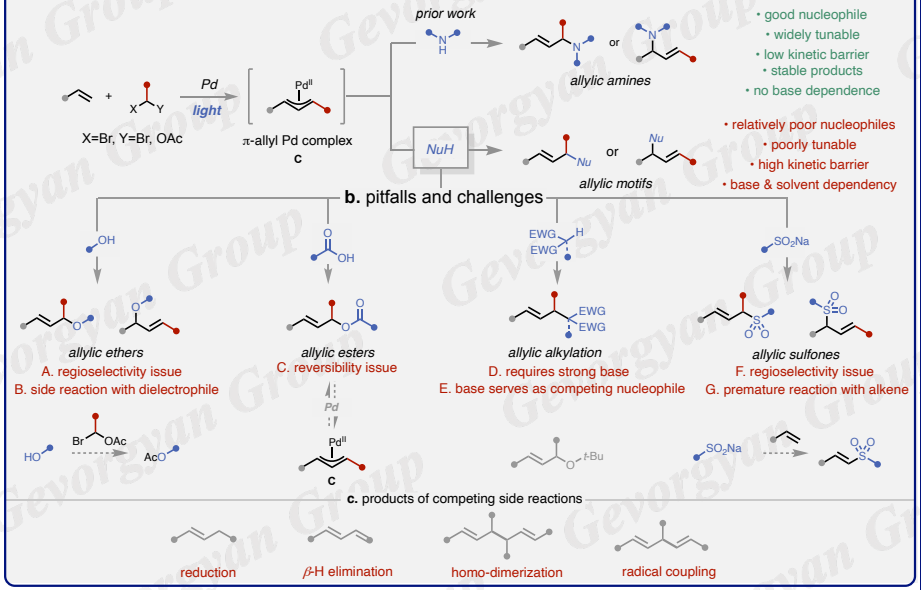


c. This work: One-step linchpin approach

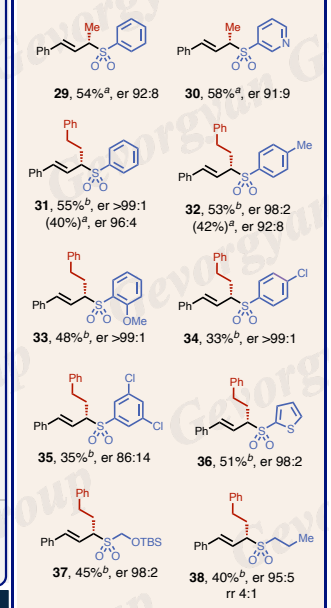


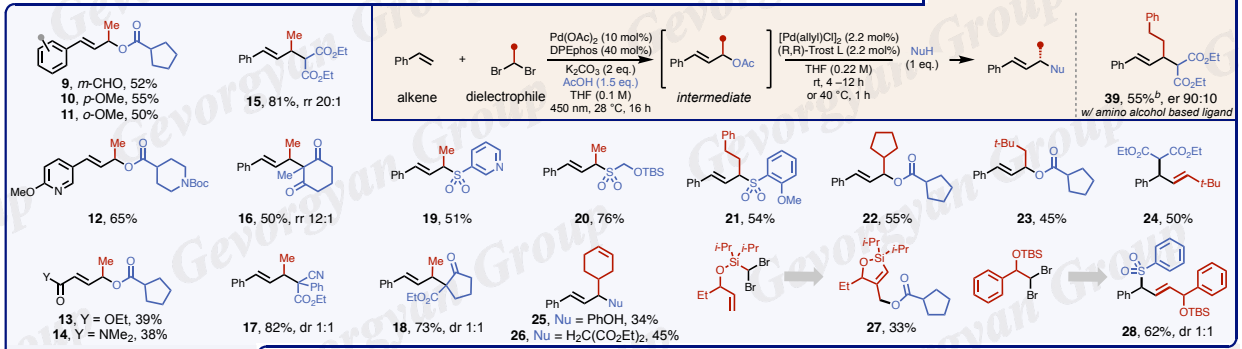
Reaction Design

a. state of the art and reaction design

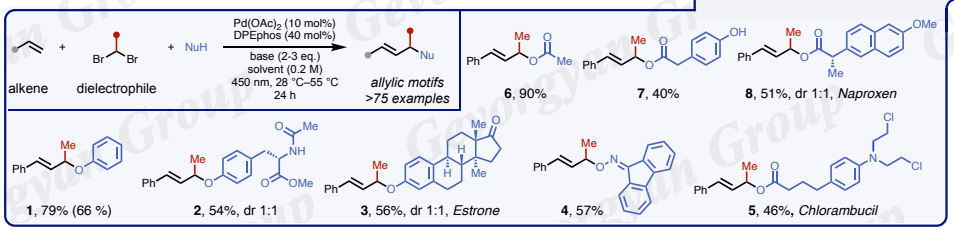


Stereoselective Examples





Substrate Scope



Acknowledgments

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Publication

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