CHEMISTRY & BIOCHEMISTRY

SEMINAR PROGRAM

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We Are Pleased to Announce a Seminar
Presented by

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Friday, March 31, 2023
1:00 pm
SLSRC 2430

Basic Group in Stereoselective Gold Chemistry: From Ligand-Enabled Cooperative Catalysis to A General Approach to S_N2-type Glycosylation

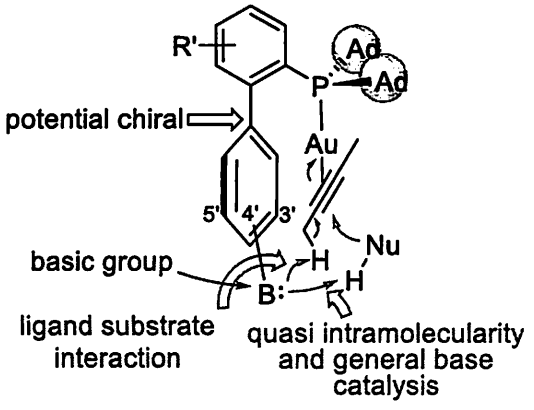
Metal-ligand cooperation is a versatile strategy for achieving efficient and/or stereoselective catalysis. Since 2014, we have developed a range of enabling remotely basic group-functionalized biaryl-2-ylphospine ligands (see Scheme A) for cooperative gold catalysis. With chiral elements built into these ligands, asymmetric transformations are developed in mechanistically rational manners. DFT calculations confirm the critical participation of the ligand remote basic group in catalysis. Several recent developments will be discussed. This type of bifunctional ligands also enables cooperative catalysis by other metals including Cu and Ag.

A different yet related approach to achieving stereoselective gold catalysis is developed specifically to address the long-standing challenge in carbohydrate synthesis, i.e., the lack of stereoselective synthesis of glycosidic bonds applicable to every sugar type. In this approach, as shown in Scheme B, a basic group is installed onto the anomeric leaving group of the carbohydrate donor and serves to direct the backend attack by a carbohydrate acceptor upon the leaving group activation by gold. The S_N2 nature of the glycosylation and the general tolerance of many sugar types make this approach appealing. The progress made in this area will discussed.

Refreshments will be served.

(continued on back)

A. Designed bifunctional ligands for cooperative gold catalysis



B. The Directing-Group-on-Leaving-Group strategy toward S_N2 glycosylation