Selective Functionalization with Small and Large Catalysts

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The selective introduction or modification of functional groups in complex molecules has been a longstanding challenge in catalysis. Our group has developed practical methods for the catalytic functionalization of C-H bonds with main group reagents, which led us to a general strategy for installing a single temporary functional group to form a range of products from one C-H bond functionalization reaction. This research has led us further toward systems for the functionalization of complex molecules and toward new classes of catalysts for selective reactions by combining transition-metal reactivity with enzymatic selectivity.

This lecture will present recent directions of research in our group toward discovering selective reactions of both small and complex molecules. The design and selection, as well as the intimate mechanism, of catalysts and catalytic reactions for selective functionalization processes will be presented.