

The Department of Chemistry presents the
**22nd Annual Lloyd B. Thomas
Chemistry Scholars Lecture**

Thursday, November 19, 2015
3:30 pm, Jesse Wrench Auditorium

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“Influence and Opportunities for Catalysis”

Abstract

From Prozac to perfume, sustainable plastics to solar energy, catalysis enables our current standard of living and controls our potential to progress sustainably. The reduced emissions of modern cars, the abundance of fresh food at our stores, the beginnings of green energy, and the new pharmaceuticals we use to treat disease are made possible by chemical reactions controlled by catalysts. But how well can we design a new catalyst or a needed catalytic reaction? If we could design fundamentally new catalytic reactions, then new approaches to the synthesis of organic molecules could be realized. The design of such catalysts and catalytic reactions is widely viewed as a grand challenge of synthetic chemistry.

Research in my group has sought to design catalysts that create an approach to chemical synthesis by conducting reactions at typically inert portions of organic molecules. Organic molecules contain clusters of atoms called “functional groups” where most chemical reactions occur. The sections of the molecules containing carbon-hydrogen (C-H) bonds are typically considered inert. We have discovered catalysts that create new chemical reactions that occur at these typically inert C-H bonds and, thereby, create new strategies for the construction of organic molecules and new methods to modify the composition of structurally complex organic molecules.

This lecture will discuss the principles by which these new catalysts are designed. Examples of important catalysts used today, and examples of catalysts developed through discovery and design in my own research laboratory will be described.

