

# Cofactors as a Source of Inspiration for the Discovery of New Reactions

**Prof. Michael Clift**  
Department of Chemistry  
University of Kansas



The discovery of new reactions that 1) convert feedstock chemicals into high-value targets or 2) enable the late-stage functionalization of complex molecules is a central tenant of organic synthesis. Our group is interested in developing such reactions by leveraging the power of cofactor mimics as organocatalysts. Enzymes utilize cofactors in biological systems to enable a diverse range of chemical reactions. Over the past few decades, synthetic chemists have successfully developed small molecule mimics of certain cofactors, and these efforts have led to the discovery of thousands of new transformations.

Our research has focused on the use of quinone cofactor mimics to enable the synthesis of amines through  $\alpha$ -C-H and C-C bond functionalization. These studies have fueled the development of several new methods for the synthesis of  $\alpha$ -branched amines, and the serendipitous discovery of novel methods for the synthesis of highly functionalized amines. The latter methodology has been

exploited in the context of natural product total synthesis, enabling rapid access to the antimalarial target calothrixin B. Our efforts in this area have since spurred an interest in the development of new synthetic strategies for targeting antibacterial alkaloids, specifically berberine and synthetic derivatives thereof. The discovery, development, and application of these transformations will be presented.

Date: Wed, Jan 31, 2018  
Time: 4:30-5:30 pm  
Location: 208 Clark Hall

Students, meet the speaker over coffee and cookies in the Bennett Conference room at 3:30 pm