UNIVERSITY OF RHODE ISLAND
Department of Chemistry
SEMINAR

Room 105 Beaupre
3:00 P.M., Monday, March 16, 2020

Prof. Jonathan A. Ellman

Yale University
New Haven, CT

"New C–H functionalization reactions for the rapid preparation of pharmaceuticals and natural products"

HOST

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New C–H functionalization reactions for the rapid preparation of pharmaceuticals and natural products

Jonathan A. Ellman
Yale University

Versatile and highly functional group compatible Rh- and Co-catalyzed annulations will be described for the rapid assembly of drug relevant nitrogen heterocycles from simple and readily available inputs. Reactions will be presented that proceed through imidoyl C–H activation to provide many different classes of nitrogen heterocycles by annulations with a variety of different coupling partners. These types of reactions are particularly useful not only due to their high functional group compatibility but also because the imine starting materials can be generated in situ from vast numbers of aldehydes and amines. The first examples of three-component sequential C–H bond additions to two different coupling partners will also be reported. This approach will be described for multiple types of coupling partners and for transformations that proceed with high regioselectivity and stereoselectivity. Catalytic cycles will be proposed that are supported by structural characterization of metallacycle intermediates, regio- and stereochemical outcomes of reactions, and the use of isotopically labeled substrates. The utility of the disclosed methods will be illustrated by short and efficient syntheses of natural products and pharmaceutical agents.