KANSAS STATE UNIVERSITY

Department of Chemistry

King Hall 04
Thursday, Feb 13, 2020
1:30pm
Coffee and Cookies provided & 1:15pm

Making the Complex Simple: Exploring New Amine Chemical Space via Unusual Reactive Intermediates

Professor Jennifer Schomaker
Professor
University of Wisconsin-Madison
Department of Chemistry

Abstract

The need for efficient access to molecules of importance to human health drives the development of innovative synthetic methods. Our group has had a long-standing interest in exploring stereochemically complex molecular space not well-represented in typical drug screening libraries. This had led to new methods to transform simple precursors into densely functionalized amines, azetidines, pyrrolidines, piperidines and amine-bearing carbocycles to speed the identification of novel amine chemical space with useful bioactivity. This talk will discuss strategies to harness the unique reactivity of unusual intermediates (methyleneaziridines, aziridinium ylides, 2-amidoallyl cations) accessed from allenes, alkenes, and 1,3-dienes, for the stereocontrolled syntheses of diverse N-heterocycles and amine-bearing carbocycles. The versatility of our methods is highlighted by the syntheses of analogs of jogyamycin, an aminocyclopentitol natural product with potent anti-malarial activity, and the identification of other amine scaffolds with promising biological activities.

Biography

Jennifer grew up in mid-Michigan, where she learned to appreciate the seasons, cold weather included. She received her bachelor's degree in chemistry from Saginaw Valley State University while she was employed at the Dow Chemical Company in Midland, Michigan, involved the development of biocatalytic methods for the synthesis of enantiomerically pure monomers. She then moved to the Agricultural Chemicals Process Research group where she participated in the route selection and scale-up campaigns for two new herbicides. While raising two young daughters, she completed a M.S. degree under the direction of Dr. Thomas J. Delia at Central Michigan University, where she worked on the development of selective cross-coupling reactions of pyrimidines and the synthesis of molecules active against Pneumocystic carinii pneumonia. The methodology portion of her Ph.D. research with Professor Babak Borhan at Michigan State University focused on the development of mild, ylide-mediated homologative ring expansions of epoxides and aziridines and the implementation of a tandem aza-Payne/hydroamination reaction for the synthesis of substituted pyrrolidines. After completing her Ph.D. in 2006, she then moved to Berkeley as an NIH postdoctoral fellow in the labs of Professor Robert G. Bergman. Her post-doctoral research, a collaboration with Professor F. Dean Toste, involved exploiting a novel mode of reactivity of cobalt dinitrosoalkane complexes to enable the mild functionalization of the C-H bonds of alkenes. Jennifer joined the faculty at UW-Madison in July 2009, where she now serves as Professor of Chemistry.