

SMS Spring 2022 Seminar Series

Friday Feb 18 | 2:30pm | Biodesign Auditorium

Searching for Selective Catalytic Reactions in Complex Molecular Environments

This lecture will describe recent developments in our efforts to develop catalysts for asymmetric reactions, in particular for the preparation of densely functionalized, stereochemically complex structures. Over time, our foci have been on enantioselectivity, site-selectivity and chemoselectivity. In much of our current work, we are studying issues of enantioselectivity as a prelude to the extrapolation of catalysis concepts to more complex molecular settings where multiple issues are presented in a singular substrate. Mechanistic paradigms, and their associated ambiguities – especially in light of catalyst or substrate conformational dynamics – will figure strongly in the lecture, raising analogies to enzymes. Finally, several interesting – and often unexpected – collaborations with colleagues in industry will be discussed.

Scott Miller, PhD

Professor, Yale University

Scott J. Miller received his B.A. (1989), M.A. (1989) and Ph.D. (1994) from Harvard University, where he worked in the laboratories of Professor David Evans as a National Science Foundation Predoctoral Fellow. Subsequently, he traveled to the California Institute of Technology where he was a National Science Foundation Postdoctoral Fellow in the laboratory of Professor Robert Grubbs until 1996.

Professor Miller's research program focuses on problems in catalysis. His group employs strategies that include catalyst design, the development of combinatorial techniques for catalyst screening, and the application of these approaches to the preparation of biologically active agents. Several recent interests of his laboratory are (a) the exploration of potential analogies between synthetic catalysts and enzymes, (b) catalytic control over dynamic stereochemical issues, (c) the selective functionalization of complex molecules, and (d) the discovery of molecules that are effective antibiotics and antivirals, despite increasing resistance challenges.

Scott Miller's current awards and honors include: National Institutes of Health MERIT Award (2011); Fellow of the American Association for the Advancement of Science (2012); American Chemical Society Award for Creative Work in Synthetic Organic Chemistry (2016); Member, American Academy of Arts and Sciences (2016); Max Tishler Prize, Harvard University (2017); Fellow of the American Chemical Society (2018), Japan Society for the Promotion of Science Invitational Fellowship for Research (2019), and Member, National Academy of Sciences (2020).

Professor Miller has served in an advisory capacity for a number of public and private concerns, including the Board of Chemical Sciences and Technology of the National Academies, and as a member of numerous review panels for various funding agencies, including the National Institutes of Health Study Section "Synthetic and Biological Chemistry B," which he chaired from 2009-2010. He recently completed a term (2012-2015) on the National Institute of General Medical Sciences Advisory Council, convened by the Director of the NIGMS and the Director of the National Institutes of Health. He now serves as Editor-in-Chief of The Journal of Organic Chemistry.



*ZOOM option available: <https://asu.zoom.us/j/87081218152>