

2025 Organic Synthesis Lectureship Series



Professor Scott E. Denmark
Reynold C. Fuson Professor of Chemistry
University of Illinois Urbana-Champaign
5/5/2025 Monday, WO 1205 4pm-5pm

TITLE: Mechanistic and Preparative Aspects of the Suzuki-Miyaura Cross-Coupling Reaction

Biography: Professor Scott E. Denmark was born in Lynbrook, NY in 1953. He obtained a S. B. from the Massachusetts Institute of Technology in 1975 and a D.Sc. Tech. from the ETH-Zürich under the direction of Albert Eschenmoser in 1980. That same year he was appointed as assistant professor at the University of Illinois and since 1991 has been the Reynold C. Fuson Professor of Chemistry. Professor Denmark has won a number of honors including the Pedler and Robert Robinson Medals (RSC), the Aldrich Award for Creative Work in Synthetic Organic Chemistry, Brown Award for Creative Research in Synthetic Methods, the F. S. Kipping Award in Silicon Chemistry (ACS), the Prelog Medal, Noyori Prize and the Paracelsus Prize. He is currently on the Board of Directors of *Organic Reactions and Organic Syntheses* and serves on the Editorial Advisory Boards of the *Journal of the American Chemical Society*, the *Journal of Organic Chemistry* and *Organic Letters*.

Research: The research in Professor Denmark's group is primarily involved with the invention of new synthetic reactions, on the origin of stereocontrol in fundamental carbon-carbon and carbon-heteroatom bond forming reactions, and in the application of these developments to the synthesis of complex molecular structures. A continuing theme of the work in these laboratories is the relationship between structure, reactivity and stereoselectivity in a variety of organo-element systems, particularly, silicon, phosphorus, tin, sulfur and lithium containing compounds. In recent years this interest has focused on palladium catalyzed cross-coupling reactions with organofunctional silicon compounds, asymmetric catalysis of carbonyl and olefin addition reactions and chiral Lewis base activation of Lewis acids. In addition, his research program encompasses the development and application of tandem heterodiene cycloadditions for the

synthesis of complex natural (alkaloids) and unnatural (fenestranes) nitrogen containing compounds. In recent years the tandem cycloaddition has been employed as a discovery engine for the investigation of structure/selectivity-reactivity relationships in asymmetric phase transfer catalysis with chiral quaternary ammonium ions. In recent years, his group has investigated the use of chemoinformatics and machine learning to identify and optimize catalysts for a variety of organic and organometallic reactions. His Research group maintains a long-standing interest in catalytic enantioselective reactions with organozinc and other organometallic reagents.

Recent Honors and Awards:

Paracelsus Prize (Swiss Chemical Society), 2020
Ryoji Noyori Prize (Society of Synthetic Organic Chemistry, Japan), 2019
EROS 2019 Best Reagent of the Year Award, 2019
The *Journal of Organic Chemistry* Outstanding Publication of the Year Award Lectureship, 2019
National Academy of Sciences, Member, 2018
American Academy of Arts and Sciences, Member, 2017
Harry and Carol Mosher Award of the Santa Clara Section of the ACS, 2014
Frederic Stanley Kipping Award in Silicon Chemistry (ACS), 2014
ISHC Senior Award in Heterocyclic Chemistry, 2011
Fellow, American Chemical Society, 2009 (inaugural year)
Herbert C. Brown Award for Creative Research in Synthetic Methods (ACS), 2009
Robert Robinson Medal and Lectureship (Royal Society of Chemistry) 2008
Prelog Medal (ETH-Zürich, Switzerland), 2007

Selected Publications:

Bock, M. J., & Denmark, S. E. (2024). Rapid, Homogenous, B-Alkyl Suzuki-Miyaura Cross-Coupling of Boronic Esters. *Journal of Organic Chemistry*, 89(22), 16195-16202. <https://doi.org/10.1021/acs.joc.4c00089>

Burke, M. D., Denmark, S. E., Diao, Y., Han, J., Switzky, R., & Zhao, H. (2024). Molecule Maker Lab Institute: Accelerating, advancing, and democratizing molecular innovation. *AI Magazine*, 45(1), 117-123. <https://doi.org/10.1002/aaai.12154>

Cunningham, C. C., Panger, J. L., Lupi, M., & Denmark, S. E. (2024). Organoselenium-Catalyzed Enantioselective Synthesis of 2-Oxazolidinones from Alkenes. *Organic Letters*, 26(31), 6703-6708. <https://doi.org/10.1021/acs.orglett.4c02377>

Delaney, C. P., Zahrt, A. F., Kassel, V. M., & Denmark, S. E. (2024). Effects of Ring Size and Steric Encumbrance on Boron-to-Palladium Transmetalation from Arylboronic Esters. *Journal of Organic Chemistry*, 89(22), 16170-16184. <https://doi.org/10.1021/acs.joc.3c02629>

Olen, C. L., Zahrt, A. F., Reilly, S. W., Schultz, D., Emerson, K., Candito, D., Wang, X., Strotman, N. A., & Denmark, S. E. (2024). Chemoinformatic Catalyst Selection Methods for the Optimization of Copper-Bis(oxazoline)-Mediated, Asymmetric, Vinylogous Mukaiyama Aldol Reactions. *ACS Catalysis*, 14(4), 2642-2655. <https://doi.org/10.1021/acscatal.3c05903>