# Bioprivileged Molecules: A Strategy for Next Generation Chemical Products

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Much of the effort in converting biomass to biobased chemicals has been driven by the opportunistic synthesis/isolation of a specific molecule or the retrosynthesis of target molecules. While these are reasonable approaches for a technology area in its infancy, the realization of viable biobased chemical development will require more systematic strategies that are robust in the face of realistic constraints. Importantly, these postulated strategies will dictate the research questions that will need to be addressed. Presented will be a new strategy of synthesizing "bioprivileged molecules," which are biology-derived chemical species that can be readily converted to a diversity of chemical products including drop-in replacements ***and*** novel species while be discussed. The dual potential for bioprivileged molecule can help create value from biomass since innovative bioproducts represents a powerful driver for the development of biobased chemicals beyond just replacing fossil carbon with renewable carbon. The important role of these molecules has been initially developed by our Center for Biorenewable Chemicals (CBiRC) through the integration of biological and chemical conversions. Ongoing efforts involve combining these synthesis routes with a computational framework. Several examples of bioprivileged molecules will be presented.

**Bio:**
Dr. Brent Shanks is an Anson Marston Distinguished Professor in Engineering and the Mike and Jean Steffenson Chair in Chemical and Biological Engineering at Iowa State University. He established and serves as Director of the NSF Engineering Research Center for Biorenewable Chemicals (CBiRC). After receiving his B.S. degree from Iowa State University in 1983, he completed his Ph.D. degree at the California Institute of Technology in 1988. From 1988 to 1999 he worked as a Research Engineer and Department Manager in the Catalyst Department at the Shell Chemical Company technology center in Houston, Texas. He joined the faculty at Iowa State University in 1999 where his group's research has primarily involved novel heterogeneous catalyst systems for efficiently converting biological-based feedstocks to chemicals.