



Rensselaer

The HOWARD P. ISERMANN
DEPARTMENT OF CHEMICAL AND
BIOLOGICAL ENGINEERING

CBE Seminar Series – Spring 2020

Dr. Andreas Bommarius

Professor of Chemical & Biomolecular Engineering
Georgia Institute of Technology

Seminar: Wednesday, January 22, 2020
9:30 a.m. (RI 203)

“Process Engineering in Pharma and Life Sciences”

Abstract:

While manufacturing traditionally often has been treated as an afterthought in the pharmaceutical industry, concepts such as process intensification and Green Chemistry now form an integral part of drug development. We will present several examples, which make use of quintessential chemical engineering skills such as kinetics, reactor design, and transport. Continuous Manufacturing, well established in the (petro)chemical industry, only recently made inroads into Pharma. We have developed an enzyme-catalyzed reactive crystallization to the beta-lactam antibiotics amoxicillin and cephalexin and will discuss improved enzyme and crystallization kinetics as well as a process model. Oxygen transfer is one of the most important limitations of biotechnological processes. Our bubble column design with stagnant liquid phase for O₂-driven deracemizations combines high oxygen transfer rate while keeping enzyme deactivation to a minimum. Lastly, we discuss how the formation of amyloids, thought to be involved in several neurodegenerative diseases, depends on genetic elements and biophysical properties of the solution.

Biography:



Andreas (Andy) S. Bommarius is a professor of Chemical and Biomolecular Engineering as well of Chemistry and Biochemistry at the Georgia Institute of Technology in Atlanta, GA. He received his diploma in Chemistry in 1984 at the Technical University of Munich, Germany and his Chemical Engineering B.S. and Ph.D. degrees in 1982 and 1989 at MIT, Cambridge, MA.

From 1990-2000, he led the Laboratory of Enzyme Catalysis at Degussa (now Evonik) in Wolfgang, Germany, where his work ranged from immobilizing homogenous catalysts in membrane reactors to large-scale cofactor-regenerated redox reactions to pharma intermediates.

At Georgia Tech since 2000, his research interests cover green chemistry and biomolecular engineering, specifically biocatalyst development and protein stability studies. His lab applies data-driven protein engineering to improve protein properties on catalysts ranging from ene and nitro reductases to cellobiohydrolases. Bommarius has guided the repositioning of the curriculum towards

Chemical and Biomolecular Engineering by developing new courses in Process Design, Biocatalysis and Metabolic Engineering, as well as Drug Design, Development, and Delivery (D4), an interdisciplinary course with Mark Prausnitz.

Andy Bommarius in 2008 became a Fellow of the American Institute of Medical and Biological Engineering. Since 2010, he is Director of the NSF-I/UCR Center for Pharmaceutical Development (CPD), a Center focusing on process development, drug substance and product stability, and novel analytical methods for the characterization of drug substances and excipients.

Refreshments will be available in the Ricketts Coonley Lounge (120) at 9:00 a.m.

For more information, please contact Lisa Martin (swishl@rpi.edu)