LSU CENTER FOR COMPUTATION & TECHNOLOGY
Interdisciplinary | Innovative | Inventive

LOUISIANA STATE UNIVERSITY

Events

- Current Events
- Lectures ▼
- Events Archive ▼

Other - Enabling Process Innovation through Computation (EPIC) Seminar Series

Digital Drug Product Design: From Crystal Structure to Process Structure

Michael F. Doherty, University of California Santa Barbara

Professor, Department of Chemical Engineering

Digital Media Center Theatre
December 02, 2016 - 03:00 pm

Abstract:

Virtually all small molecular weight drugs are isolated as crystalline particles, and over 90% of all pharmaceutical products are formulated in particulate, generally crystalline form. Normally, the properties of the crystalline solid (especially polymorph and crystal shape) have a major impact on the functionality of the product as well as the design and operation of the manufacturing process, and in most cases the two cannot considered separately.

Batch processing is the traditional method for producing drug products, which suffers from several drawbacks, including batch-to-batch variability and high manufacturing costs. The major name-brand drug companies are becoming more interested in developing continuous manufacturing processes, but these too have their own challenges, particularly speed & cost of process development, and forbidden recycles. I will report on recent innovations for (1) polymorph selection by continuous processing, (2) predicting crystal morphology for each polymorph, (3) bounding the maximum and minimum achievable particle sizes as a function of the key process design variables using attainable region concepts. Some remaining challenges will be discussed.

Watch the seminar online at: http://lsu.webex.com/meet/nandakumar

---

Speaker's Bio:

Prof. Doherty received his BS from Imperial College London and his PhD from Univ of Cambridge. His pioneering research spans many areas of chemical engineering. Recent focus is among the following topics: process intensification and innovation in the areas of separation with chemical reaction, crystallization of organic materials, and protein synthesis and conceptual design of chemical process systems. His contributions have been recognized by numerous awards: most recently he was elected to the National Academy of Engineering in 2015. He received the EV Murphree Award for Industrial and Engineering Chemistry from American Chemical Society. He is a sought after lecturer with may distinguished lectures to his credit which include Stanley Katz memorial lecture at CUNY, Roger Sargent Lecture and Centennial lecture at Imperial College London, Dow-Sharma Lectures at Univ Institute of Chemical Technology, Bombay, India, Distinguished Researcher Lecture at Carnegie Mellon, Merck, Sharp and Dohme Lectures, University of Puerto Rico. (for complete details: see https://www.chemengr.ucsb.edu/people/michael-doherty). He is also sought after in advisory capacity by many advisory boards among both traditional chemical and pharma industries as well as academic institutions and he shares his time and wisdom generously.