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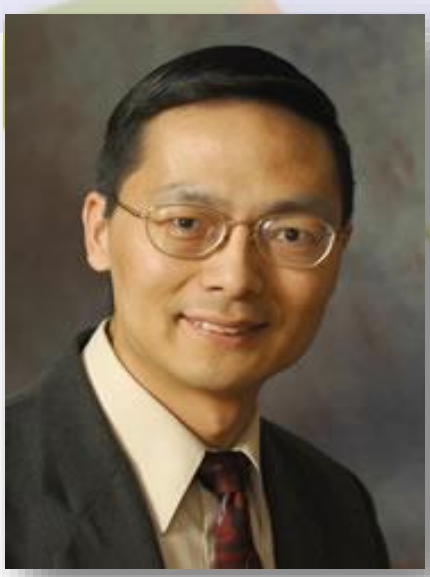
TEMASEK LIFESCIENCES LABORATORY

18 June 2015 (Thursday), 4pm
The Auditorium (Level 1)

Hosted by: Prof Chua Namhai & Dr Sarojam Rajani

Challenges and Opportunities in Synthetic Biology

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Dr. Huimin Zhao is the Centennial Endowed Chair Professor of chemical and biomolecular engineering, and professor of chemistry, biochemistry, biophysics, and bioengineering at the University of Illinois at Urbana-Champaign (UIUC). He received his Ph.D. degree in Chemistry from the California Institute of Technology in 1998 under the guidance of Dr. Frances Arnold. His primary research interests are in the development and applications of synthetic biology tools to address society's most daunting challenges in health, energy, and sustainability, and in the fundamental aspects of enzyme catalysis, cell metabolism, and gene regulation. Dr. Zhao has published over 200 research articles and over 20 issued and pending patent applications with several being licensed by industry. He is a recipient of numerous awards including Elmer Gaden Award (2014), Guggenheim Fellowship (2012), Fellow of the American Association for the Advancement of Science (AAAS) (2010).

Synthetic biology is the deliberate design of novel or improved biological systems and organisms that draws on principles elucidated by biologists, chemists, physicists, and engineers. It is a rapidly growing area with broad applications in medical, chemical, food, and agricultural industries. In this talk, I will briefly discuss the challenges and opportunities in synthetic biology and highlight our recent work on the development and application of novel foundational synthetic biology tools. Specifically, I will introduce the Illinois Biological Foundry for Advanced Biomanufacturing (iBioFAB) that we have been establishing to automate the design-build-test-analyze cycle and discuss its three potential biotechnological applications. The first is the discovery, characterization, and engineering of novel natural product biosynthetic pathways for drug discovery and development. The second is the design, construction and optimization of biochemical pathways and microbial factories for economic production of chemicals and fuels. The third is the development of high throughput genome engineering tools for mammalian synthetic biology applications.

Recent Publications:

1. X. Feng, J. Lian, and **H. Zhao.** "Metabolic Engineering of Saccharomyces cerevisiae to Improve 1-Hexadecanol Production." Metabolic Engineering, 27, 10-19 (2015)
2. Y. Luo, R. E. Cobb, and **H. Zhao.** "Recent Advances in Natural Product Discovery." Current Opinion in Biotechnology, 30, 230–237 (2014)
3. J. Lian, T. Si, N.U. Nair, and **H. Zhao**. "Design and Construction of Acetyl-CoA Overproducing Saccharomyces cerevisiae Strains." Metabolic Engineering, 24, 139-149 (2014)