SCMS Seminar

BOTTOM-UP ASSEMBLY OF MICROBIAL COMMUNITIES: MODELING, ANALYSIS AND ENGINEERING

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Time: 10:00-11:00, Tuesday, 15th August, 2017

Venue: Room 2201, Guanghua Eastern Main Building, Handan Campus

Abstract: Microbes are of fundamental importance to human health, environment and agriculture. To exploit their potential for various purposes, a fundamental challenge is to decipher the basic rules underlying microbial assemblages that are often heterogeneous in space and time. My lab aims to address the challenge using a bottom-up approach that combines biophysical modeling with experimental synthetic biology. Recently, we developed a computational platform that enables individual-based simulation of microbial communities across multiple scales. Using the platform, we investigated how the modes of cellular social interactions and the spatial scale of interaction contribute to microbial assemblages, both of which were also determined with experimental ecosystems. Using engineered cellular interactions, we further demonstrated the utility of synthetic microbial consortia for applications in metabolic engineering. Our studies provide insights into the organization of microbial communities, and illustrate the potential of synthetic ecosystems for practical purposes.

Short Biography: Dr. Ting Lu is an Associate Professor in the Department of Bioengineering at the University of Illinois at Urbana-Champaign (UIUC). He is also a faculty affiliate in the Institute for Genomic Biology, Department of Physics, and Center for Biophysics and Quantitative Biology at UIUC. Dr. Lu's research focuses on the design, construction and exploitation of bacterial gene regulatory networks for cellular functionality programming. Particularly, he is interested in understanding the collective behaviors of microbial communities and the development of probiotic bacteria for biomedical applications.