UCLA Engineering

Chemical and Biomolecular Engineering



SEMINARS IN CHEMICAL AND BIOMOLECULAR ENGINEERING



Friday, Jan. 11, 2019 10:00am - 11:00am Boelter Hall 3400

Irene Chen

Assistant Professor Chemistry & Biochemistry | Biomolecular Science & Engineering UC Santa Barbara

"Molecular evolution at the origin of life and applications for the present day"

Creating a living system from minimal starting materials is an important synthetic goal. A simple living system could be based on RNA molecules, which can both carry genetic information and catalyze chemical reactions. We study the emergence and evolution of catalytic RNA by mapping "fitness landscapes", or the complete sequence-activity relationship, to gain a quantitative understanding of evolutionary potential. We also study membranes, an essential component of living systems, and their effect on encapsulated RNAs. In addition to de novo evolution of new functional molecules, we take advantage of billions of years of evolution to engineer nanomaterials based on bacterial viruses. I will present our recent results and their implications for understanding the origin of life as well as potential biotechnological applications.

Irene Chen is an Assistant Professor at the University of California, Santa Barbara, in the Department of Chemistry and Biochemistry and Program in Biomolecular Science and Engineering. She received an undergraduate degree in Chemistry and an MD-PhD in Biophysics at Harvard. Her work on "bottom-up" synthetic biology began as a graduate student in the laboratory of Jack Szostak and continued as a Bauer Fellow in systems biology at Harvard. The goal of her lab is to understand molecular evolution and apply this knowledge toward minimal cells and biomedical challenges. She has been named an Investigator of the Simons Collaboration on the Origins of Life (since 2013), Searle Scholar (2014), NIH New Innovator (2016), and Dreyfus Teacher-Scholar (2018).