

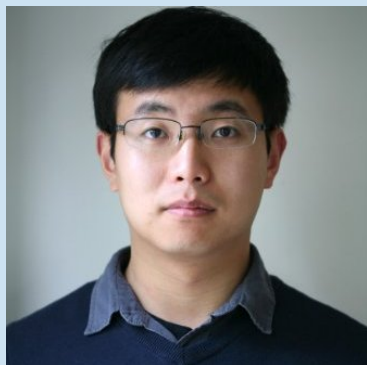


Faculty Candidate Seminar

LUO MI

Postdoc Research Fellow

University of California,
Los Angeles



Thursday,
February 16, 2017

9:30 -10:30 am
102 Chemistry

Living on Edge: Engineering Bacteria-polymer Interactions for Biofuel and Biomedical Applications

Abstract

Bacterial interactions with polymeric surfaces are prevalent in nature and crucial in many areas of engineering. Some prominent examples include biofilm formation and cellulose degradation. For its various manifestations, the outcome of this interaction is largely dictated by both players of the duet: the chemical/mechanical nature of the polymer surface and the physiological condition/genetic makeup of the surface-bound bacteria. This talk aims to examine engineering efforts on both facets of this interaction in the context of biofuel and biomedical applications. First, several surface engineering strategies and implementations that can effectively attract, repel or eliminate bacteria will be discussed using bioinspired zwitterionic polymers as an example. This part of the talk revolves around demonstrating the capacity of molecular design in manipulating bacteria interfacial behavior under biomedical settings. The second part of the talk focuses on metabolic engineering of the key Consolidated Bioprocessing (CBP) microorganism *Clostridium thermocellum*, arguably the most efficient cellulose-binding-and degrading bacterial species known. Results on engineering the *C.thermocellum* keto-acid pathway to convert plant biomass to advanced biofuels will be presented. Specific challenges associated with engineering non-model organisms and roadblocks towards an economically viable biofuel production will also be discussed.

Biography

Luo Mi is a Postdoc Research Fellow in UCLA working for Professor James C. Liao. His current research project focuses on renewable energy production from plant biomass using synthetic biology approaches. Prior to his relocation to California in June 2014, Luo had been a member of the University of Washington Chemical Engineering Department for six years under the guidance of Professor Shaoyi Jiang. Luo received top departmental honor (2013) for his PhD research on biomaterials, polymer chemistry and antimicrobial agents.