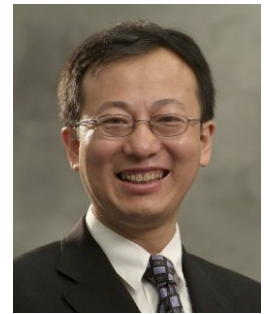


When: Friday 15:00 – 16:00

Where: ETB 1003

Speaker: Prof. Joshua S Yuan

Associate Professor
Department of Plant Pathology & Microbiology
Texas A&M University



Title: Biodesign of Plant and Microbes for Sustainable Production of Fuels and Chemicals

Date: 03-24-2017

Abstract: Our lab aims to employ design-based engineering to address the challenges in energy, environment, and health. The design-based engineering strategies focused on chemical, computational, and systems biology analyses to understand the fundamental mechanisms and to guide the design of enzymes, processes, microorganisms, and plant for various applications. While the principle can be broadly applied, our research primarily focused on increasing biorefinery waste utilization and enhancing photosynthetic terpene production. For biorefinery waste utilization, we have employed systems biology-guided design to achieve effective fractionation and conversion of lignin. The fractionated lignin has enabled multiple bioproduct streams to maximize the biorefinery economics and sustainability. For photosynthetic terpene production, the research combined mathematical modeling and synthetic biology design to overcome one of the most challenging issues in renewable energy, the harnessing of sunlight to drive the conversion of carbon. We have integrated computational modeling of the metabolic bottlenecks with synthetic biology design to overcome these bottlenecks to achieve a record level of volatile terpene production in *Synechococcus elongatus* PCC 7942. The principle was used in tobacco to design, model, and implement various strategies to achieve record yield of squalene.