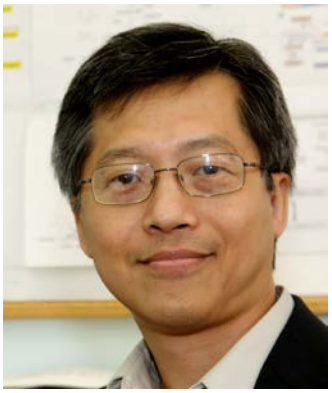
Department of Chemical Engineering Seminar Series

Rewiring Metabolism



Jim Liao

Professor & Chair – Chemical & Biomolecular Eng.
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Monday, April 20, 2015
Lecture: 4:00-5:00 p.m.
Physics Astronomy Building (PAA) A118
Reception at 3:30 p.m. PAA A118

Abstract

The key metabolic pathways, the enzymes involved, and their reaction mechanisms were largely elucidated through a collection of heroic efforts in the mid-20th century. Since then, metabolism has often been neglected as a field of solved problem attracting little attention. Instead, genetic regulation and signaling pathways have become the major focus of research in the following decades. With the growing understanding of biochemical functions of the cells and the organisms, time is ripe for re-thinking and re-designing the metabolic pathways to solve problems in energy and medicine.

These two seemingly unrelated fields are surprisingly linked at the level of metabolism. Efficient energy metabolism is both crucial to the biological production of fuels as well as managing obesity, cancer metabolism, and brain function. In this talk, we will first discuss how fundamental metabolic pathways can be re-designed to afford efficient biofuel production. We will then show how a synthetic (non-natural) metabolic pathway introduced in mice was able to resist diet-induced obesity. Such strategies in metabolic rewiring may open a new frontier in medical research as well as future therapeutic interventions.

Speaker Biography

Dr. James C. Liao is Ralph M. Parsons Foundation Professor and Department Chair of Chemical and Biomolecular Engineering of UCLA. He received numerous awards and recognitions, including the Presidential Green Chemistry Challenge Award (2010), the White House **"**Champion of Change" for innovations in renewable energy (2012), the ENI Renewable Energy Prize (2013), and the National Academy of Sciences Award for the Industrial Application of Science (2014). He is a member of the US National Academy of Engineering and Academia Sinica in Taiwan.