



Professor James C. Liao
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Synthetic Biology: Re-design of Metabolism for Carbon Management

The key metabolic pathways, enzymes involved, and their reaction mechanisms were largely elucidated through a collection of efforts in the 20th century. Since then, metabolism has often been neglected as a field attracting relatively little attention. However, metabolism is key to cellular functions, disease mechanisms, as well as global carbon cycle. With the growing understanding of biochemical functions of the cells and organisms, it is time to re-think and re-design the metabolic networks to solve problems in energy production (and medical care) that cells were not evolved to deal with. 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 discuss how fundamental metabolic pathways can be re-designed to afford efficient carbon management. We attempt to derive principles of metabolic engineering from both computational and experimental aspects.

Biography

Dr. James C. Liao, President, Academia Sinica, is a pioneer in Metabolic Engineering, Synthetic Biology, and Systems Biology. He received numerous awards and recognitions, including the Presidential Green Chemistry Challenge Award, the White House "Champion of Change" for innovations in renewable energy, the ENI Renewable Energy Prize bestowed by the President of Italy, and the National Academy of Sciences Award for the Industrial Application of Science. He is an elected Member of the National Academy of Engineering, National Academy of Sciences, and Academician of Academia Sinica in Taiwan.

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Chaired by A/P Matthew Chang