

ENI AWARD 2013
Renewable Energy Prize

James C. Liao

Co-Winner with Frances H. Arnold

Synthesis of isobutanol and other higher alcohols as biofuels

Biography

James Liao is Parsons Foundation Professor and Chair of Department of Chemical and Biomolecular Engineering at the University of California, Los Angeles.

One of the worldwide most appreciated experts in metabolic engineering and synthetic biology, Professor Liao obtained his Bachelor of Science from the National Taiwan University. It was followed in 1987 by a PhD degree at the University of Wisconsin-Madison and by a period spent as a research scientist at Rochester, working for the Eastman Kodak Company. In 1990 he joined the Texas A&M University, while in 1997 he moved to the University of California, Los Angeles.

His current research interests are mainly focused on biological synthesis of fuels and chemicals, carbon and nitrogen assimilation, metabolic engineering and synthetic biology, transcriptional and metabolic networks analysis and fatty acid metabolism.

Together with his research group, Professor Liao developed synthetic pathways for production of isobutanol and other higher alcohols from various raw materials. He deepened biological regulatory networks at the systems level, developing both experimental and computational methods for better understanding and predicting cellular behaviour. They developed a breakthrough technique, called Network Component Analysis (NCA), using mRNA expression and transcriptional network connectivity to determine network component dynamics, functions, and interactions. The team designed novel synthetic gene-metabolic circuits, in order to demonstrate system-wide understanding of cellular regulation.

During his outstanding scientific career, he has been awarded with many recognitions. Among them, the NSF Young Investigator Award in 1992, the Merck Award for Metabolic Engineering in 2006 and the Food, Pharmaceutical and Bioengineering Division award of American Institute of Chemical Engineers in the same year. He then won the Charles Thom Award of the Society for Industrial Microbiology in 2007 and the Marvin Johnson Award of American Chemical Society in 2009. In 2010, he received the Presidential Green Chemistry Challenge Award. In 2012, Professor James Liao was proclaimed the White House Champion of Change in Renewable Energy and in 2013 he was elected to the National Academy of Engineering.