



ENI AWARD 2017

Energy Frontiers

Jens Nielsen

Winner

Renewable Production of Fuels and Chemicals by Yeast

Research Description

Professor Jens Nielsen has contributed a number of innovative technical and scientific solutions that have transformed and tremendously advanced the field of microbial cell factories. His most significant pioneering contributions include the tools for construction of genome-scale metabolic models, methods for metabolic flux analysis, development of systems biology techniques and metabolic engineering principles in design of cell factories. Professor Nielsen's laboratory has successfully implemented these approaches in optimizing the metabolism of various microbes for production of antibiotics, enzymes, and different types of small molecules, including biofuels and platform chemicals. The engineering and analytical tools developed in Professor Nielsen's laboratory are widely used by the entire metabolic engineering community, and represent an important cornerstone for the entire field. Professor Nielsen's current research in the area of microbial cell factories is focused mainly on systems biology of yeast metabolism and development of the yeast *Saccharomyces cerevisiae* as a cell factory for production of fuels and chemicals. Professor Nielsen is also very active in the biomedical field. He has made fundamental contributions in sequencing and analysis of bacterial metagenomes, and characterization of the interaction between bacteria and the human host. The general applicability of Professor Nielsen's genome-scale models is illustrated by his recent studies in systems medicine, where such models were successfully used to map the metabolic alterations in complex metabolic disease, such as diabetes. Last, but not least, Professor Nielsen is an inspiring mentor. Possibly his greatest contribution to biotechnology is a phalanx of highly educated and motivated researches issued from his laboratory, many of whom will undoubtedly lead this field in the future.