

Biodiesel Process Simulation with *Chlamydomonas reinhardtii* metabolic network model

전민규, 김보은, 이재형*

KAIST

(jayhlee@kaist.ac.kr*)

In this presentation, we will discuss a simulation about batch-system biodiesel production under autotrophic condition with metabolic network of microalgae. It is a key issue to identify metabolism trade-off phenomenon between cell growth and lipid accumulation for optimizing biodiesel productivity. First, we connect macroscopic dynamic model and metabolic network model, which is widely used to predict the metabolic behavior in a microbial cell, using Michaelis-Menten kinetics. In addition, there are two objective functions which are added in the model and they can calculate cell growth rate and lipid synthesis rate. Second, we try to decide the time-dependent weighting factor to decipher the trade-off relationship between two objective functions and predict the next metabolism state with multi-objective optimization (MO) method. This study for biodiesel production simulation will suggest the potential for identification of synergistic combinations of prediction of microalgae metabolism and optimization of cultivation conditions.