

Engineering of *Corynebacterium glutamicum* through consolidated bioprocessing for succinate production from CO₂-grown microalgal biomass as carbon source

_____* , _____, _____¹, Michael Bott², _____, _____¹
 ;¹ _____ ;² Institute of Bio- and Geosciences, Forschungszentrum Juelich
 (hmwoo@kist.re.kr*)

This study presents the development of consolidated bioprocessing for succinate production from microalgal biomass using engineered *Corynebacterium glutamicum*. *C. glutamicum* wild type is able to utilize glucose but not able to utilize starch as sole carbon source. Starch-degrading and succinate-producing *C. glutamicum* strains produced succinate (0.16 g succinate/g total carbon source) from a mixture of starch and glucose as a model microalgal biomass. Subsequently, the engineered *C. glutamicum* strains were able to produce succinate (0.28 g succinate/g of total sugars) from pretreated microalgal biomass of CO₂-grown *Chlamydomonas reinhardtii*. For the first time, this work shows succinate production from CO₂ via sequential fermentations of CO₂-grown microalgae and engineered *C. glutamicum*. This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (MEST) (2014, University-Institute cooperation program).