# Engineering of *Corynebacterium glutamicum* to utilize D-cellobiose by *in vivo* direct evolution

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Corynebacterium glutamicum is a widely-known industrial bacterium for amino acid and varieties of biochemical. C. glutmaicum is able to use sucrose and glucose as carbon source. We have focused on the utilization of cellobiose from lignocellulosic biomass hydrolyzed with endo- and exo-cellulsase without b-glucosidase. C. glutamicum, not-utilizing cellobiose as sole carbon source, was engineered by introducing cellobiose utilization pathway constructed in the BioBrick-formatted expression vector systems. The cellobiose utilization pathway consists of cellodextrin transporter and β-glucosidases from other microorganisms. Heterologous target genes were synthetized and optimized via in vivo direct evolution. Engineered C. glutamicum strains were capable of utilizing cellobiose as sole carbon source and reached the same of optical density that wild-type cells grew with the same carbon concentrations. The strains will be further applied to industrial strains to produce variety of chemicals. This work was supported by the NRF of Korea Grant funded by the Korean Government (Ministry of Science, ICT & Future Planning) (2014, UIP) and Creative Allied Program (CAP-KIST) (2E24832).