Increasing 5-aminolevulinic acid production in engineered *Corynebacterium glutamicum* via metabolic flux perturbation

AHMADBAZLIRAMZI, 현정은, 한성옥†
고려대학교
(samhan@korea.ac.kr†)

5-aminolevulinic acid (ALA) is an important metabolite for various biological processes and has been increasingly used in agricultural and medical fields. By considering the innate capability to overproduce glutamate, *Corynebacterium glutamicum* was chosen as a host for the biological production of ALA. For this purpose, mutated HemA (glutamyl t-RNA reductase) from Salmonella typhimurium was expressed to confer ALA production in C5 pathway hence utilizing the endogenous glutamate production route. Cultivation of the recombinant strain produced about 204 mg/L of ALA after 48 hours. Co-expression of HemL (glutamate-1-semialdehyde aminotransferase) further increased ALA concentration up to 457 mg/L which denoted a 25.9-fold increase over the control strain (pMT-Trc vector, 17 mg/L of ALA). Effects of metabolic perturbation on ALA production were performed of which addition of iron-chelating 2,2'-dipyridyl led to 529 mg/L of ALA being produced. Addition of glutamate-enhancing penicillin G gave out the highest ALA yield of about 584 mg/L of ALA. The results obtained from this study thus demonstrated the potential of developing *C. glutamicum* strain for the biological production of ALA via metabolic engineering.