Production of 3-aminopropionic acid by metabolically engineered *Escherichia coli*

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3-aminopropionic acid (3-AP) is important platform chemical for the production of acrylamide and acrylonitrile. The previously developed fumaric acid producing *E. coli* strain was used as base strain. To convert L-aspartate to 3-AP, the *C. glutamicum panD* gene (encoding L-aspartate-α-decarboxylase) was overexpressed. The native promoter of the *aspA* gene was replaced with the *trc* promoter to increase flux to aspartate. Also, the *ppc* gene (encoding phosphoenolpyruvate carboxylase) was overexpressed and ammonium sulfate was supplemented in the medium. Then, 3.49 g/L 3-AP was produced. The 3-AP titer was increased to 3.94 g/L through optimization of PPC expression level by using synthetic promoters and RBS sequences. To reduce acetic acid accumulation, native promoter of the *acs* gene was replaced with the *trc* promoter. Fed-batch cultures of final strains resulted in the production of 32.3 g/L 3-AP in 39 h. (This work was supported by the Technology Development Program to Solve Climate Changes on Systems Metabolic Engineering for Biorefineries from the Ministry of Science and ICT through the National Research Foundation (NRF) of Korea (NRF-2012M1A2A2026556 and NRF-2012M1A2A2026557)).