

Engineering *E. coli* for the production of 3-aminopropionic acid

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We report metabolic engineering of *Escherichia coli* for the production of 3-aminopropionic acid (3-AP). A fumarate-producing *E. coli* strain was modified by chromosomal overexpression of *aspA* (aspartase), enabling conversion of fumarate to aspartate. Aspartate was then converted to 3-AP by expression of the *C. glutamicum panD* gene (L-aspartate- α -decarboxylase). Additional overexpression of the *aspA* and phosphoenolpyruvate carboxylase (*ppc*) genes allowed production of 3.49 g/L 3-AP. Further optimization of the *ppc* expression, combined with chromosomal overexpression of *acs*, resulted in production of 32.3 g/L 3-AP in 39 h in fed-batch. [This work was supported by the Technology Development Program to Solve Climate Changes on Systems Metabolic Engineering for Biorefineries from the Ministry of Science, ICT and Future Planning (MSIP) through the National Research Foundation (NRF) of Korea (NRF-2012-C1AAA001-2012M1A2A2026556). MG also received support from the Swedish research council Formas].