Metabolic engineering of *C. glutamicum* for L-arginine production

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L-arginine was produced by metabolically engineered *Corynebacterium glutamicum*. Random mutagenesis was first done on *C. glutamicum* to increase tolerance to L-arginine. The PPP flux was strengthened by downregulating the pgi gene and overexpressing the opcA, pgl, tal, tkt, and zwf genes. Next, the Ncgl1221 gene encoding L-glutamate exporter was inactivated to channel L-glutamate to L-arginine formation. Also, the expression levels of the argF and carAB genes were optimized to convert L-ornithine to L-citrulline effectively. Finally, the argGH operon was overexpressed. Fed-batch fermentation of the final strain was performed in a 1,500 L bioreactor produced 81 g/L of L-arginine. The approaches described here will be useful in developing strains of Corynebacteria regarding the production of arginine and its derivatives. [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-2012M1A2A2026556 and NRF-2012M1A2A2026557)]