Development of Robust Glycolic Acid-Producing *E. coli* strain through Evolutionary and Metabolic Engineering

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Existing engineered GA-producing strains have limited substrate consumption capacity due to carbon catabolite repression (CCR). Herein, *E. coli* utilizing D-xylose via Dahms pathway was further engineered to allow cellobiose uptake by expressing *cep94A* gene from *S. degredans*. Unlike glucose, cellobiose does not repress D-xylose uptake and metabolism as its intracellular degradation detours CCR resulting in maximum yield of 0.51 g GA g^{-1} xylose. For a rapid cellobiose consumption, the GA-producing strain was subjected to adaptive laboratory evolution leading to the development of industrially-competitive GA-producing *E. coli* strain. This work was supported by the National Research Foundation of Korea (NRF) under the Basic Science Research Program through the Ministry of Education (2018R1D1A1B07043993 and 2020R1A6A1A03038817), and by the Korea Institute of Energy Technology Evaluation and Planning (KETEP) funded by the Ministry of Trade, Industry & Energy (MOTIE, No. 20194010201750).