Synthetic small regulatory RNAs development for metabolic engineering in *Escherichia coli*

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Converntional genome engineering for gene expression manipulation has been considered to be laborious and time-consuming. Therefore, synthetic small regulatory RNAs were developed for targeted regulation of gene expression in *Escherichia coli*. Gene expression is thus knocked down by blocking the translation initiation region (TIR) of a target gene. As a proof-of-concept study, a tyrosine overproducer *E. coli* strain was obtained by testing combinatorial knockdown of four target genes in 14 *E. coli* strains. The isolated strain was capable of producing 2 g/L of tyrosine. Also, by using a library of 130 synthetic sRNAs, we screened effective gene knockdown targets including *murE*, which increased cadaverine production by 55%. (This work was supported by the Technology Development Program to Solve Climate Changes on Systems Metabolic Engineering for Biorefineries from the MSIT through the NRF of Korea (NRF-2012M1A2A2026556 and NRF-2012M1A2A2026557); the Intelligent Synthetic Biology Center through the Global Frontier Project (2011-0031963) of the MSIT through the NRF of Korea; the Commercializations Promotion Agency for R&D Outcomes(COMPA) funded by the MSIT)