Fine Control of Gene Expression Using Small Regulatory RNA and Its Application in Chemical Production from *Escherichia coli*

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We developed the fine-tuned gene expression using controlled sRNA expression level. Applying this in metabolic engineering, putrescine production strains with five levels of sRNA against endogenous genes were constructed and used to identify knockdown targets for productivity enhancement. Isolated strains were combined and optimized through multiple target fine-tuned knockdown. The fed-batch cultivation of final engineered strain shows dramatically increased productivity and yield putrescine. [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); the Intelligent Synthetic Biology Center through the Global Frontier Project (2011-0031963) of the Ministry of Education, Science and Technology (MEST) through the National Research Foundation of Korea; the Commercializations Promotion Agency for R&D Outcomes(COMPA-2015K000365) funded by the Ministry of Science, ICT and Future Planning(MISP).]