

Development of Phenol-Producing *Escherichia coli* using Synthetic sRNA Strategy

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Biological production of phenol has been limited by its toxicity and complex regulatory metabolic network. To address these issues, 18 *Escherichia coli* strains were engineered using synthetic sRNA. The engineered BL21 strain, which was selected by the production of immediate precursor tyrosine, enzyme activity and its tolerance, showed the highest phenol titer of 419 mg/L in flask and 1.69 g/L in fed-batch culture. In biphasic fermentation using tributyrin as an organic phase, the concentration of phenol in tributyrin and culture broth reached 9.84 g/L and 0.3 g/L in 21 h, respectively, which were equivalent to the final phenol titer and productivity of 3.79 g/L and 0.18 g/L/h, respectively. These are the highest values reported up to date by any biological route. [This work was supported by the Intelligent Synthetic Biology Center through the Global Frontier Project (2011-0031963) of the Ministry of Science, ICT & Future Planning through the National Research Foundation of Korea.]