

Biosynthesis of Phenol from Glucose in *Escherichia coli* through sRNA-based knock-down system

김지용, 정해나, 김병진, 박혜권, 이상엽[†]
한국과학기술원
(leesy@kaist.ac.kr[†])

Previously, phenol's biological production from renewable resources has been limited due to its toxicity to microorganisms. In this study, we simultaneously engineered 18 *Escherichia coli* strains for the production of phenol by employing the strategy of synthetic regulatory sRNA technology. The 18 engineered *E. coli* strains showed significant differences in the production of tyrosine, tyrosine phenol-lyase activity, and tolerance to phenol. These results led to much variation in their phenol-producing capabilities. The final concentration of phenol in the glycerol tributyrates phase and fermentation broth reached 9.84 and 0.3 g/L, in 21 h, respectively. This is the highest titer achieved by microbial fermentation. Although further engineering is required to be competitive with the current petro-based process, the strategies used for this study will provide a valuable framework for the microbial production of toxic chemicals. [This work was supported by the Intelligent Synthetic Biology Center through the Global Frontier Project (2011-0031963) funded by the Ministry of Science and ICT (MSIT) through the National Research Foundation (NRF) of Korea.]