1-propanol production from overproduced amino acid in metabolically engineered Escherichai Coli

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1-propanol is considered as a promising new generation of biofuel that can substitute a gasoline. In this study, we introduced a novel biosynthetic pathway toward 1-propanol using L-threonine overproducing Escherichia coli as a base strain. The highest titer of 1-propanol (3.5g/L) was achieved by Atsumi et al., using recombinant Escherichia coli harboring heterogenous gene encoding Methanococcus jannaschii citramalate synthase (CimA), which directly converts pyruvate into 2-ketobutyrate. The previously reported E. coli TH20 which overproducing L-threonine was used as base strain in this study. To generate 1-propanol producing E. coli strain, competing pathways were deleted and carbon source was optimized by in silico flux reponse analysis. Further metabolic engineering of the final strain improved the production rate moreover. [This work was supported by the Advanced Biomass R&D Center of Korea (ABC-2010-0029799) through the Global Frontier Research Program of the Ministry of Education, Science and Technology (MEST). Further supports by BioFuelChem, EEWS program of KAIST, and the World Class University program (R32-2008-000-10142-0) of the MEST are appreciated.]