

Metabolic engineering of *Escherichia coli* for the fumaric acid production

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Fumaric acid is a naturally occurring organic acid which is an intermediate of the tricarboxylic acid cycle. In this study, we chose *Escherichia coli* as a host for the production of fumaric acid, since the genetic and physiological understandings of this organism are well-established. To produce fumaric acid aerobically, we deleted *iclR* gene to redirect the carbon flux through the glyoxylate cycle, which was followed by deletion of three fumarase genes, *fumA*, *fumB*, and *fumC*. Even though the wild-type *E. coli* does not produce fumaric acid under the aerobic conditions, the resulting strain produced fumaric acid with significant titer. Further studies are required to enhance the yield and titer of fumaric acid. [This work was supported by the Technology Development Program to Solve Climate Changes from National Research Foundation of Korea (Development of systems metabolic engineering platform technologies for biorefineries; NRF-2012-C1AAA001-2012M1A2A2026556) funded by the Ministry of Education, Science and Technology. Further supports by the World Class University Program (R32-2008-000-10142-0) of the MEST were appreciated.]