

Comparing *Escherichia coli* B and K strains in metabolic engineering

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Butyric acid pathway genes were introduced to *Escherichia coli* from *Clostridium acetobutyricum* strain. The butyric acid synthetic genes consisting of *thiL* and HCB operon (*hbd*, *crt*, *bcd*, and *etfA/etfB*) were cloned and expressed under T7 promoter in *E.coli*. Acyl-CoA thioesterase II (*tesB*) gene from *E.coli* MG1655 was also overexpressed. These genes were overexpressed in both *E.coli* BL21(DE3) and JM109(DE3). The concentration of 0.3 g/L butyric acid was achieved from shake flask culture containing LB fed with 1% glycerol in both strains. To improve the productivity, we deleted *pta* (phosphate acetyltransferase) and *ptsG* (a glucose-specific PTS enzyme) in both *E. coli* strains. The deletion mutants produced more butyric acid under a similar fermentation condition. The effects of metabolic gene knock-outs and amplifications were compared in the two *E. coli* strains.