Enhanced production of poly(3-hydroxybutyrate) based on proteome analysis

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We have previously analyzed the proteome of recombinant *Escherichia coli* producing poly(3-hydroxybutyrate) [P(3HB)] and revealed that the expression level of several enzymes in central metabolism are proportional to the amount of P(3HB) accumulated in the cells. Based on these results, the amplification effects of triosephosphate isomerase (TpiA) and fructose-bisphosphate aldolase (FbaA) on P(3HB) synthesis were examined in the three *E. coli* strains. Amplification of TpiA and FbaA significantly increased the P(3HB) contents and concentrations in the three *E. coli* strains. TpiA amplification in *E. coli* XL1-Blue lacI increased P(3HB) from 0.4 to 1.6 to g/l from glucose. Thus amplification of glycolytic pathway enzymes is a good strategy for efficient production of P(3HB) by allowing increased glycolytic pathway flux to make more acetyl-CoA available for P(3HB) biosynthesis. [This work was supported by the Technology Development Program to Solve Climate Changes (Systems metabolic engineering for biorefineries) from the Ministry of Science, ICT and Future Planning (MSIP) through the NRF (NRF-2012-C1AAA001-2012M1A2A2026556) is appreciated]