

Biosynthesis of medium-chain-length poly(3-hydroxyalkanoates) in recombinant *Escherichia coli*

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Abstract

In this study, we constructed the *fadA* and/or *fadB* mutant *Escherichia coli* strains for the production of medium-chain-length (MCL) polyhydroxyalkanoate (PHA) production. All the *fad* mutant *E. coli* strains were enough to support the MCL-PHA biosynthesis when equipped with MCL-PHA synthase. However, the monomer composition of PHA was highly dependent upon the metabolic capability of host strains and substrate specificity of PHA synthase. The expression of PHA synthase in *fadA* and/or *fadB* mutant *E. coli* strains yielded the accumulation of MCL-PHA, the constituents of which were composed of 3-hydroxybutyrate (3HB), 3-hydroxyhexanoate (3HHx), 3-hydroxyoctanoate (3HO), 3-hydroxydecanoate (3HD), and 3-hydroxydodecanoate (3HDD) depending on the carbon number of used fatty acid.

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