Production of Polyhydroxyalkanoates (PHAs) Containing 2-Hydroxybutyrate (2HB) by Metabolic Engineered *Escherichia coli*

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PHAs are biodegradable and biocompatible compounds. The recombinant *E. coli* expressing evolved *Clostridium propionicum* propionyl-CoA transferase (Pct_{Cp}) and *Pseudomonas* sp. MBEL 6-19 PHA synthase 1 (PhaC1_{Ps6-19}) was developed and cultured in a chemically defined medium containing 20 g/L of glucose with various concentrations of 2HB and 3HB. Also, heterologous metabolic pathway to supply 2-HB from glucose was constructed via the citramalate pathway. Recombinant *E. coli* expressing the *phaC1437, pct540, cimA3.7,* and *leuBCD* genes together with the *L. lactis* II 1403 *panE* gene successfully produced PHAs consisting of 2HB, 3HB, and a small fraction of lactate by varying the 3HB concentration on MR medium [This work was supported by the Technology Development Program to Solve Climate Changes (systems metabolic engineering for biorefineries) from the Ministry of Education, Science and Technology (MEST) through the National Research Foundation of Korea (NRF-2012-C1AAA001-2012M1A2A2026556) and by the Intelligent Synthetic Biology Center (2011-0031963) through the Global Frontier Research Program of the MEST.]