

BIOTECHNOLOGY & BIOENGINEERING

*Ralstonia eutropha* PHB<sup>-</sup>4 重组菌合成 PHA 共聚物及性质测定

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**摘要** A series of polyhydroxyalkanoate (PHA) copolymers consisting of short-chain-length (SCL) and medium-chain-length (MCL) 3-hydroxyalkanoate (3HA) monomers were synthesized in the recombinant *Ralstonia eutropha* PHB<sup>-</sup>4 harboring a low-substrate-specificity PHA synthase PhaC2Ps from *Pseudomonas stutzeri* 1317. These polyesters, whose monomer compositions varied widely in chain length, were purified and characterized by acetone fractionation, nuclear magnetic resonance (NMR), gel-permeation chromatography (GPC), and differential scanning calorimetry (DSC). This was the first time that the physical properties of PHA copolymers polymerized by PhaC2Ps were characterized. The results indicated that the variation in MCL 3HA contents did not have an obvious influence on the molecular weights of these PHA copolymers but was effective in changing their physical properties. The variation in the thermal property of PHA copolymers with 3-hydroxyoctanoate (3HO) content was also investigated in this study.

**关键词** [polyhydroxybutyrate](#) [PHA synthase](#) [physical property](#) [Pseudomonas stutzeri](#)

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**Biosynthesis and characterization of polyhydroxyalkanoate copolyesters in *Ralstonia eutropha* PHB<sup>-</sup>4 harboring a low-substrate-specificity PHA synthase PhaC2<sub>Ps</sub> from *Pseudomonas stutzeri* 1317**

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**Abstract** A series of polyhydroxyalkanoate (PHA) copolymers consisting of short-chain-length (SCL) and medium-chain-length (MCL) 3-hydroxyalkanoate (3HA) monomers were synthesized in the recombinant *Ralstonia eutropha* PHB<sup>-</sup>4 harboring a low-substrate-specificity PHA synthase PhaC2Ps from *Pseudomonas stutzeri* 1317. These polyesters, whose monomer compositions varied widely in chain length, were purified and characterized by acetone fractionation, nuclear magnetic resonance (NMR), gel-permeation chromatography (GPC), and differential scanning calorimetry (DSC). This was the first time that the physical properties of PHA copolymers polymerized by PhaC2Ps were characterized. The results indicated that the variation in MCL 3HA contents did not have an obvious influence on the molecular weights of these PHA copolymers but was effective in changing their physical properties. The variation in the thermal property of PHA copolymers with 3-hydroxyoctanoate (3HO) content was also investigated in this study.

**Key words** [polyhydroxybutyrate](#); [PHA synthase](#); [physical property](#); [Pseudomonas stutzeri](#)

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