E311 Bacterial Poly(3-hydroxyalkanoates) Bearing Aryloxy Substituents

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Poly(3-hydroxyalkanoates), PHAs, bearing aromatic groups were biosynthesized by *Pseudomonas putida* and *Pseudomonas oleovorans* grown with various carbon substrates mixtures of nonanoic acid, NA, and alkanoic acids containing aromatic groups such as 5-phenylvaleric acid and *p*-methylphenoxyalkanoic acids. *P. putida* grown solely with either 6-*p*-methylphenoxyhexanoic acid or 8-*p*-methylphenoxyoctanoic acid, 8-MPO, produced PHAs containing 3-hydroxy-4-*p*-methylphenoxybutyrate and 3-hydroxy-6-*p*-methylphenoxyhexanoate. A trace amount of 3-hydroxy-8-*p*-methylphenoxyoctanoate was also detected in the PHA synthesized from 8-MPO. This PHA was crystalline with melting and glass transition temperatures of 20 and 91 ℃, respectively. No liquid crystalline transition was observed from this polymer as determined by differential scanning calorimetry and polarizing microscopy analysis. PHAs biosynthesized by two microorganisms from mixtures of NA and 8-MPO were found to be random copolymers of significantly different compositions that could be separated from each other by hexane fractionation. *P. putida* was capable of utilizing carbon substrates containing aryloxy groups for growth and PHA accumulation more efficiently than *P. oleovorans*.

E312 Evaluation of Carbon Substrates Containig Functional Groups for the Synthesis of Unusual Poly(3-hydroxyalkanoates) by *Pseudomonas putida* KCTC 2407

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Biosynthesis of unusual poly(3-hydroxyalkanoates), PHAs, from carbon substrates bearing various functional groups such as bromine, chlorine, alkoxy, hydroxyl, cyano, carboxyl, amino, phenyl, phenoxy, methylphenoxy, alkoxyphenoxy, cyclohexyl, cyanophenoxy, and olefin by *Pseudomonas putida* were investigated. 6-Bromohexanoate, 6-methoxyhexanoate, 6-ethoxyhexanoate, 8-hydroxyoctanoate (8-HO), 11-aminoundecanoate (11-AUD), 4-cyclohexylbutyrate, 11-methylphenoxyundecanoate, 8-cyanophenoxyoctanoate, and 6-phenoxyhexanoate did not support growth of *P. putida* when solely given these carbon substrates. No production of PHA containig functional repeating units was observed in *P. putida* grown with an equimolar mixture of nonanoate (NA) and each carbon substrate bearing reactive groups such as bromine, chlorine, alkoxy, methoxyethoxy. Particularly, this microorganism grown on each mixture of 8-HO, 16-hydroxyhexadecanoate, 11-cyanoundecanoate, 11-AUD and 8-ethoxyphenoxyoctanoate with NA did not accumulate PHA in the cells even from NA as well as above five carbon sources. Even though 10-undecenoate, 10-UND(=), did not nearly support biosynthesis of PHA in the cells, remarkable amounts of PHAs containing unsaturated repeating units were accumulated when NA was cofed as a cosubstrate. *P. putida* also biosynthesized poly(3-hydroxyalkanoates-*co*-3-hydroxyalkenoates-*co*-3-hydroxyalkynoates) copolyester from an equimolar mixture of NA, 10-UND (=), and 10-undecynoate.