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一种通过重组大肠杆菌和重组恶臭假单胞菌生产3-羟基癸酸的新方法

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摘要 3-hydroxydecanoic acid (3HD) is an interesting intermediate for chemical synthesis of many valuable compounds. A novel method to produce 3HD by recombinant bacteria was constructed in Escherichia coli HB101 and Pseudomonas putida GPp104, respectively. Simultaneous expression of both phaG encoding (R)-3-hydroxydecanoyl-ACP:CoA transacylase and tesB encoding thioesterase Ⅱ in E. coli HB101 increased 3HD production approximate 1.7-folds compared with the expression of phaG gene alone under identical conditions. In addition, when the tesB gene was introduced into the strain, the polyhydroxyalkanoate synthase negative strain P. putida GPp104 produced extracellular 3HD. Thus, a novel pathway to produce 3HD by recombinant Pseudomonas was comstructed. It was also found that the ratio of carbon source to nitrogen source affected the production of 3HD by recombinant P.putida harboring tesB gene. Nitrogen limitation seemed to promote the extracellular 3HD production.

关键词 3-羟基癸酸; 聚羟烷酸; 酶催化重组; 酶催化重组; 酶; 生物降解性; 生产工艺;
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A Novel Method for Production of 3-Hydroxydecanoic Acid by Recombinant Escherichia coli and Pseudomonas putida

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Abstract 3-hydroxydecanoic acid (3HD) is an interesting intermediate for chemical synthesis of many valuable compounds. A novel method to produce 3HD by recombinant bacteria was constructed in Escherichia coli HB101 and Pseudomonas putida GPp104, respectively. Simultaneous expression of both phaG encoding (R)-3-hydroxydecanoyl-ACP:CoA transacylase and tesB encoding thioesterase Ⅱ in E. coli HB101 increased 3HD production approximate 1.7-folds compared with the expression of phaG gene alone under identical conditions. In addition, when the tesB gene was introduced into the strain, the polyhydroxyalkanoate synthase negative strain P. putida GPp104 produced extracellular 3HD. Thus, a novel pathway to produce 3HD by recombinant Pseudomonas was constructed. It was also found that the ratio of carbon source to nitrogen source affected the production of 3HD by recombinant P.putida harboring tesB gene. Nitrogen limitation seemed to promote the extracellular 3HD production.

Key words 3-hydroxydecanoic acid; polyhydroxyalkanoates; Escherichia coli; Pseudomonas putida; (R)-3-hydroxydecanoyl-ACP:CoA transacylase; thioesterase II; PHB;

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