生物分解性塑膠(PHA)合成酵素基因之結構分析

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摘 要

POLY(HYDROXYALKANOATES) (PHAS)是細菌合成的聚酯類高分子，物性接近石化塑膠，可為生物分解性 塑膠之材料，但由於成本比石化塑膠高出許多而限制其用途。因此，提高產量以降低成本，改造菌株 以生產不同特性之PHA，應當可提昇此生物分解性塑膠之實用性及普及性。PHA有多種型式，依組成單 體之碳鏈長度可分成短鏈(PHASCL)、中鏈(PHAMCL)及長鏈(PHALCL)三種。PHAMCL由於碳鏈長度較長， 使其具有比PHASCL較好的熔點穩定性，且因其熔點較低，因而增加其可塑性。PSEUDOMONAS RESINOVO -RANS為一具有PHAMCL生產能力之菌株，其會依碳源、菌種之不同而堆積出不同鏈長之PHAMCL，進而增 加PHA之開發性及實用性。本研究即以此菌株為對象，先利用不同分析方法（NILE RED染色、萃沖、GAS CHROMATOGRAPHY）建立PHA生產菌的鑑定方法，並進一步對PHA合成基因進行選殖。 由GC分析結果得知，當P. RESINOVORANS以OCTANOIC ACID 或HEXANOIC ACID為碳源時，生產之PHA以中鏈PHO和PHD為主。另外在基因選殖方面，我們從P. RESINOVORANS基因庫中篩選出包含完整PHAC1-PHA Z-PHAC2 OPERON，並可能涵蓋啟動子區域之PHAGE，未來的研究，除了進一步將其它與PHA生合成相關的 基因選殖出來，並將對可能之啟動子區域，其活性及調控方式做進一步的探討。

關鍵詞 : 生物分解性塑膠、聚羥基烷酸酯、PHA合成酵素、假單胞菌(P. RESINOVORANS)

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