Development of Shuttle Vectors for Succinic Acid Producing Bacteria

이정욱, 장유신, 송효학, 이상준, 이상엽*
한국과학기술원
(leesy@kaist.ac.kr*)

In order to obtain improved succinic acid producing bacteria by metabolic engineering, shuttle vectors for *Mannheimia succiniciproducens*, *Actinobacillus succinogenes* and *Escherichia coli* were constructed. The pMVD, pME and pMEx vectors were manipulated fusing a *Mannheimia varigena* plasmid pMVSCS1 with an *E. coli* expression vector pKK223-3. The performance of the vectors was evaluated by cloning a *fumC* gene into *M. succiniciproducens* and *A. succinogenes*. The stability of the vectors was also tested by using ampicillin as a selection marker. The quantitative real-time PCR method was used to analyze the plasmid copy number. The increased level of the activity and expression of the fumarase encoded by the *fumC* gene in the recombinant *M. succiniciproducens* and *A. succinogenes* suggests that the vectors constructed in this work can be used for engineering them as a succinic acid producer.
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