Developing of Recombinant *E. coli* BL21(DE)-UDP924 and BL21(DE)-UDP888 contains Uridyltransferase Gene

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Abstract

Soluble glucan which has special properties was produced by mutant of *E. coli.* strain. Recombinant *E. coli* strains(*E. coli* BL21(DE)/CrdS-F and *E. coli* BL21(DE)/CrdS-C) contains β-1,3-Glucan synthase gene were made. For producing the soluble glucan, fermentation process was already optimized, and we confirmed soluble glucan producing by mutant of *E. coli* strain. But the productivity was low. In this study, we developed another mutants contains UTP-glucose-1-phosphate uridyltransferase gene.

Introduction

β-1,3-glucan은 *Agrobacterium sp.* ATCC31750으로부터 생성되는 Biopolymer이다. β-1,3-glucan(curdlan)은 물에서는 용해도가 낮은 경향을 보이지만 고온에서는 겔상태로 되며 온도를 내려도 더는 원상복귀하지 않는다. 이러한 특수한 성질로 인하여 산업화 되면서 많은 인기를 보이고 있다. 대사과정에서 β-1,3-glucan(curdlan)은 주요하게 glucose로부터 α-D-Glucose-1-phosphate, α-D-Glucose-6-phosphate, UDP-glucose등 과정을 거쳐 β-1,3-glucan이 합성된다. UDP-glucose가 유일한 전구체 물질이기에 대사과정에서 UDP-glucose 발현량의 향상은 glucan의 생산성에 직접적인 영향을 줄 것으로 추정된다. 본 연구에서는 β-1,3-glucan의 합성을 직접 촉진하는 효소는 아니지만 그 전구체인 UDP-glucose의 합성에 관여하는 효소인 UTP-glucose-1-phosphate uridylyltransferase[2.7.7.9] gene site를 실은 벡터를 *Escherichia coli* strain에 주입하여 UDP-glucose over-producing 균주를 개발함으로서 glucan 생산성을 높여보고자 하였다.

References

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