

Ops Gene Knock-out and Dps Gene Expression for Coenzyme Q₁₀ Production in *E.coli* BW25113

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Ubiquinone (Coenzyme Q), composed of a benzoquinone group and a side chain of varying length of isoprenoid group, is an essential component of the electron transfer system in the plasma membrane of prokaryotes and inner mitochondrial membrane of eukaryotes.¹⁾ Additional important physiological function of ubiquinone is an antioxidant activity to prevent DNA damage, lipid peroxidation, protein oxidation, etc.²⁾ To produce CoQ₁₀, useful to human, *dps*(decaprenyl diphosphate synthase) gene is an essential enzyme, which combines ten isoprenoid diphosphate as CoQ₁₀ tail. Usually, *E. coli* uses CoQ₈ to transfer the electron in the plasma membrane of prokaryotes, nevertheless this pathway is efficient to manipulation, and to acquire electron carrier enzyme. In our study, we've disrupted *ops*(octaprenyl diphosphate synthase) known to combine eight isoprenoid diphosphate in *E. coli* and have introduced *dps* gene to *E. coli* to construct CoQ₁₀ production system. That is to say, we've amplified and cloned the chloramphenicol acetyl transferase(Cm^r) gene of pKD3 into yT&A vector to help useful selection. *dps* gene containing promoter region amplified by PCR and cloned into upper region of Cm^r gene. In next, the recombinant plasmid is transformed in *E. coli* BW25113 by electroporation and cultured LB broth, induced of IPTG 1 mM for functional expression. In recombinant *E. coli*, an expression of the *dps* gene was confirmed by SDS-PAGE and the produced CoQ₁₀ are observed in HPLC.

References

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