Fed-batch fermentation of recombinant *Escherichia coli* harboring the *ddsA* gene and the *dxs* gene improved production of coenzyme Q_{10}

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Recently, coenzyme Q_{10} has been interested with respect to its physiological functions such as pro-oxidant and anti-oxidant activity. Types coenzyme Q in organisms are determined by the availability of the polyprenyl diphosphate which is catalyzed by polyprenyl diphosphate synthase. As *Escherichia coli* has endogenous octaprenyl diphosphate synthase, it can produce coenzyme Q_8 instead of coenzyme Q_{10}. In order to produce coenzyme Q_{10} in *E. coli*, the *ddsA* gene encoding decaprenyl diphosphate synthase derived from *Gluconobacter suboxydans* was cloned and expressed a constitutively. The *dxs* gene was coexpressed with the *ddsA* gene in order to increase the specific content of coenzymeQ_{10}. As production of coenzyme Q_{10} is dependent on cell growth, fed-batch fermentation was carried out to obtain high cell density and high concentration of coenzyme Q_{10}. A significant increase of dry cell mass in the fed-batch fermentation allowed coenzyme Q_{10} concentration of 46.1mg/l, corresponding to a 27-fold increase compared with the batch fermentation.