

High cell density culture of Lycopene in metabolically engineered *Escherichia coli*

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Lycopene is one of carotinoids composed of polymerized isoprene units (C5) and synthesized by many plants, algae, and microorganisms. Lycopene exhibits significant anti-carcinogenic activities and play an important role in the prevention of chronic diseases and enhancing immune response. Lycopene is an antioxidant that fights free radicals in the body and inhibit DNA oxidation that can lead to some cancers. We have engineered *Escherichia coli* strains by pathway analysis followed by cloning three genes (*crtE*, *crtB* and *crtI*) from *Erwinia uredovora*, which are essential for lycopene biosynthesis, and constructed pLyc184 plasmid. In addition, the *dxs* gene involved in the biosynthesis of lycopene precursors, was cloned and coexpressed with the three essential genes. In order to enhance lycopene production, the DO-stat high cell density cultures of metabolically engineered *E. coli* strains were carried out.