Characterization of ε-caprolactone production by recombinant *Escherichia coli* strain harboring cyclohexanone monooxygenase gene

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Cyclohexanone monooxygenase (CHMO) catalyzing Baeyer-Villiger oxidation converts cyclic ketone compounds to optically pure lactone derivatives which are used as platform materials in chemical industry. A recombinant *Escherichia coli* system was designed to express CHMO from *Acinetobacter* sp. NCIB 9871 and to optimize microbial production of ε-caprolactone from cyclohexanone. Maximum specific CHMO activity of 290 U/g cellular protein was obtained in a batch fermentation at 25℃ and 0.01 mM isopropyl-thio-β-D-galactopyranoside induction. To overcome the inhibitory effects of cyclohexanone on cell growth and ε-caprolactone production, a fed-batch fermentation was performed with continuous feeding of cyclohexanone at a rate of 0.15 g/l-hr. Low level of cyclohexanone under 0.4 g/l increased ε-caprolactone concentration to 1.2 g/l and maintained its productivity at 0.08 g/l-hr.