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Research article

Expression and purification of cholera toxin fragment B (CTB) in *E. coli*

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Abstract

Cholera toxin fragment B (CTB), a non-toxic fraction of cholera toxin produced by Vibrio cholera, is able to bind to epithelial or M cells in the intestine through the GM1-ganglioside receptor. Because of this property, CTB is a powerful mucosal immunogen and adjuvant for mucosal vaccines. In this study, *E. coli* BL21 (DE3) was used a host to produce the CTB. The induction conditions, including time, temperature, and IPTG concentration, were optimized in order to increase the expression of soluble CTB. The biological activity of the purified CTB was measured in a series of GM1-ELISA experiments. Our results indicated that the optimal IPTG concentration and induction time for CTB expression are 1 mM and 2-3 hr, respectively. Protein expression was found to decrease upon the induction time and the purified CTB protein was found to be stable at temperatures below 4^{o}C. This study provides insight into the optimized conditions for CTB expression in *E.coli* as well as the suitable temperatures for CTB storage, and information that will be useful for future studies.