Enhanced whole cell activity of organophosphorus hydrolase by chaperone co-expression in recombinant *Escherichia coli*

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Twin arginine translocation (Tat) pathway has advantage of secreting protein in periplasm after it is folded in cytoplasm. When organophosphorus hydrolase (OPH) is expressed with Tat signal sequence in *Escherichia coli*, inclusion body in cytoplasm is a dominant form. Therefore, whole cell activity is relatively low. In the present work, we investigated a strategy for overcoming this problem in a whole cell system by enforcing periplasmic secretion of OPH through chaperone co-expression. We co-expressed molecular chaperone including GroEL/ES with OPH. We found significant increase of OPH in a soluble form compared to that without chaperone and this might be due to increased protein folding. Furthermore, whole cell OPH activity of chaperone co-expressing cells was about 20 times greater than that of non-expressing cells. Chaperone may successfully assist in enhancement of whole cell OPH activity.