

Availability of stress-responsive Escherichia coli protein, CysQ, as highly effective fusion expression partner of aggregation-prone heterologous proteins

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In our previous study, expression levels of CysQ increased 2.21-fold and 1.90-fold under stress conditions with 2-hydroxyethyl disulfide (2HEDS) and guanidine hydrochloride (GdnHCl), respectively. In the present paper, using this stress-responsive protein, CysQ, as an N-terminal fusion expression partner, solubility was dramatically increased for various heterologous proteins: Pseudomonas putida cutinase (CUT), human granulocyte colony-stimulating factor (hG-CSF), human ferritin light chain (hFTN-L), arginine deiminase (ADI), human interleukin-2 (IL2), human activation induced cytidine deaminase (AID), and human glutamate decarboxylase (GAD). This is likely due to their intrinsic ability to form their native conformation, promoting molecular chaperones binding and/or chaperone-like activity. Also In addition, bioactivity, or characteristics of heterologous proteins was maintained successfully. Therefore, we concluded that CysQ is a highly effective solubility enhancer and a good fusion expression partner for the production of bio-products.