GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Expression and purification of GST-FHL2 fusion protein

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Genet. Mol. Res. 12 (4): 6372-6378 (2013)
Received November 30, 2012
Accepted May 15, 2013
Published December 6, 2013
DOI http://dx.doi.org/10.4238/2013.December.6.4

ABSTRACT. *Escherichia coli* is the most widely used host for the production of recombinant proteins. However, most eukaryotic proteins are typically obtained as insoluble, misfolded inclusion bodies that need solubilization and refolding. The interactions between human FHL2 protein and many types of proteins, including structural proteins, kinases, and several classes of transcription factor, have been found to have important roles in a variety of fundamental processes, including arrhythmia, hypertrophy, atherosclerosis, and angiogenesis. To achieve high-level expression of soluble recombinant human FHL2 protein in *E. coli*, we have constructed a recombinant expression plasmid, pGEX-4T-1-FHL2, in which we merged FHL2 cDNA with the glutathione S-transferase (GST) coding sequence downstream of the *tac* inducible promoter. Using this plasmid, we have achieved high expression of soluble FHL2 as a GST fusion protein in *E. coli* BL21. We have used the engineered plasmid (pGEX-4T-1-FHL2) and the modified *E. coli* strain to overcome the problem of removing the GST moiety while expressing soluble FHL2. Our results show that: 1) the recombinant plasmid was successfully constructed. Sequencing results showed that FHL2 and GST are in the same reading frame; 2) at 23°C, soluble GST-FHL2 fusion protein was highly expressed after induction

with 0.1 mM IPTG; and 3) GST-FHL2 can be detected by Western blotting using mouse monoclonal anti-GST antibody. Our data are the first to show that high yields of soluble FHL2 tagged with GST can be achieved in *E.coli*.

Key words: FHL2; GST; Fusion protein; Prokaryotic expression; Protein purification

