

### Baculoviral Polyhedrin as a Novel Fusion Partner for Recombinant Protein Expression in *Escherichia coli*

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Baculoviral polyhedrin, which originated from *Autographa californica* nuclear polyhedrosis virus, was employed for the first time as a novel fusion partner for expression of foreign proteins in *Escherichia coli* system. We characterized the expression of recombinant polyhedrin protein fused to green fluorescent protein (GFP). The polyhedrin fusion protein was successfully expressed as an insoluble inclusion body. The *E. coli* expressing polyhedrin-GFP fusion protein showed higher cell growth and higher GFP yield than the strain expressing soluble single GFP. Interestingly, the polyhedrin fusion portion showed almost the same characteristics as the native baculoviral polyhedrin; it was rapidly solubilized under alkaline conditions, similar to the conditions found in the insect midgut. In addition, the polyhedrin fusion portion was rapidly digested by alkaline proteases in insect *Plutella xylostella* midgut as well as by  $\alpha$ -chymotrypsin, a protease that has similar properties to insect midgut polyhedra-associated alkaline proteases. These unique properties suggest that baculoviral polyhedrin might be an advantageous fusion partner for production of foreign proteins, especially harmful proteins, in *E. coli*.