Facilitation of Expression and Purification of Antimicrobial Peptide by Fusion with Baculoviral Polyhedrin in *Escherichia coli*

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In the present work, we investigated the use of the baculoviral polyhedrin (Polh) protein as a novel fusion partner for production of a model AMP (halocidin 18 amino acid subunit; Hal18) in *Escherichia coli*. The useful solubility properties of Polh as a fusion partner facilitated expression of the Polh-Hal18 fusion protein by forming insoluble inclusion bodies in E. coli, which could be easily purified by inclusion body isolation and affinity purification using the fused hexahistidine tag. The recombinant Hal18 AMP could then be hydroxylamine cleaved from the fusion protein and easily recovered by simple dialysis and centrifugation. This was facilitated by the fact that Polh was soluble in the alkaline cleavage reaction but became insoluble during dialysis at a neutral pH. Importantly, recombinant and synthetic Hal18 peptides showed nearly identical antimicrobial activities against E. coli and Staphylococcus aureus, which were used as representative Gram-negative and Gram-positive bacteria, respectively. These results demonstrated that baculoviral Polh can provide an efficient and facile platform for production or functional study of target AMPs.