

Letter to the Editor

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Letter to the Editor: “Gene mining, recombinant expression and enzymatic characterization of N-acetylglucosamine deacetylase”

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To the Editor,
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Dear Editor,

The article written by Qiu et al. on “Gene mining, recombinant expression and enzymatic characterization of N-acetylglucosamine deacetylase” is very interesting [1]. We are writing to address a well-recognized challenge in recombinant protein production: the insolubility of bacterially expressed eukaryotic proteins. This issue often arises due to the differences in post-translational modifications, chaperone systems, and cellular environments between prokaryotic and eukaryotic cells. Many eukaryotic proteins, when expressed in *Escherichia coli*, tend to aggregate into inclusion bodies, rendering them inactive and difficult to purify [2, 3].

To overcome this challenge, several strategies have been explored. One approach is the use of fusion tags such as maltose-binding protein (MBP) or small ubiquitin-like modifier (SUMO), which can enhance solubility and facilitate proper folding. Another widely employed strategy is co-expression with molecular chaperones or foldases that assist in protein folding. Additionally,

optimizing expression conditions – such as reducing the growth temperature, using weaker promoters, or supplementing the culture medium with specific additives like osmolytes – can significantly improve solubility [2, 3].

In cases where solubility remains an issue, refolding inclusion body proteins using stepwise dialysis or chromatographic techniques may be necessary. Alternatively, shifting to eukaryotic expression systems, such as yeast, insect, or mammalian cells, can provide a more suitable environment for proper folding and functionality [3, 4].

Given the increasing reliance on bacterial systems for cost-effective protein production, further research into novel solubilization strategies is crucial. We encourage continued discussion and innovation in this field to facilitate the production of functional eukaryotic proteins for biochemical and biomedical research.

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