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Challenges of the recombinant pharmaceutical biosimilar proteins expression and enhanced refolded recovery from *E. coli*

Vivek Kumar Morya
Inha University, Republic of Korea

The expiring patents related to drug/pharmaceuticals and advancements in Recombinant DNA Technology (RDT) empower the mid/small-scale industries to produce pharmaceutical proteins at a large scale. These recombinant proteins are mainly expressed in *E. coli*, as the inclusion body. This inclusion bodies is hydrophobic and denatured lump of protein and to recover an active protein, theoretically two steps are required, first solubilization and second refolding to achieve active protein configuration. However, most of the protein fails to achieve the 100% refolding, a common problem with heterologous protein expressed in a bacterial system. Generally, industrially purified proteins from inclusion bodies are poorly folded in respect to total protein content of purified sample. Several researchers have been carried to enhance the refolding efficacy but still striving. Among those attempted methods an Ionic Liquid (ILs) supplemented refolding process has been gained a huge attention in last decade. The ILs is molten salt (below 100˚C) and regarded as green solvent for various processes. The application of ILs in protein refolding is relatively new and still in developmental phase. This present lecture is focused on application, mechanism and experimental results with ILs based refolding buffer. In this study, transforming growth factor beta 3 (TGF-β3) derived from *E. coli* host was used as refolding model protein. Refolded TGF-β3 was qualitatively analyzed via SDS-PAGE, HPLC and Fluorescence in order to calculate the refolding efficiency. The results in the present study, showed an elevated recovery of refolded protein by ILs augmented buffer, in comparison to the conventional method.

Biography

Vivek Kumar Morya has completed his PhD from DDU Gorakhpur University, Gorakhpur, India and Post-doctoral studies from Inha University, Department of Biological Engineering. He is an Assistant Professor in the Department of Bioengineering, at Inha University, Incheon, South Korea. He has published more than 25 papers in reputed journals, 5 patents, 28 Microbial Accession, and four book chapters, and has been serving as editorial Board Member of several journal of repute.

moryavivek@gmail.com

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