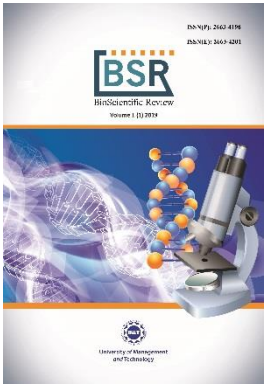

BioScientific Review (BSR)

Volume 3 Issue 4, December 2021

$ISSN_{(P)}$: 2663-4198 $ISSN_{(E)}$: 2663-4201

Journal DOI: https://doi.org/10.32350/BSR

Issue DOI: https://doi.org/10.32350/BSR.0304

Homepage: https://journals.umt.edu.pk/index.php/BSR

Journal QR Code:

Article: **Recent Developments in Recombinant Protein Expression Systems for Therapeutic Purposes**

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Article DOI: https://doi.org/10.32350/BSR.0304.i

Article QR:

Anam Amir

Citation: Amir, A, Sumrin A. Recent Developments in Recombinant Protein Expression Systems for Therapeutic Purposes. *BioSci Rev.* 2021;3(4):84–87.

Indexing

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A publication of the
Department of Life Sciences, School of Science
University of Management and Technology, Lahore, Pakistan

Recent Developments in Recombinant Protein Expression Systems for Therapeutic Purposes

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Article Info

Received: August 04, 2021
Revised: December, 13 2021
Accepted: December, 13 2021

In the past few years, the use of therapeutic recombinant proteins has rapidly expanded in the field of biotechnology. There has been a significant development in the application of the mammalian expression system for recombinant protein production which allows high gene expression, resulting in the better quality and quantity of the expressed product [1]. Chinese hamster ovary cells, murine myeloma lymphoblstoid like cells, human embryonic kidney cells, and baby hamster kidney cells have been used successfully to produce multiple pharmaceutical products [2]. Mammalian expression system improves the proper glycosylation of recombinant proteins which are very helpful in product folding, post-translational modifications, assembly and increasing solubility [3-6].

Meanwhile, in prokaryotic expression system, E. coli is widely used because it is easy to handle, multiplies rapidly, produces clones, and remains cost effective in large scale production [7]. Recently, these expression systems have been used for antibody fragment productions and their proper folding with co-expression of chaperones [8]. Moreover, E. coli has been used for the production of cancer cell penetrating peptides which warrant the targeted delivery of drugs to specific effector cells only (add reference).

Yeast systems are also currently used for antibody fragment production and the large scale production of insulin. The application of cell free expression systems allows the production of toxic proteins as there is no need to maintain cell viability [9, 10].

The purification and optimization of recombinant proteins has always been challenging for scientists who strive to increase the overall yield of the product. Many affinity chromatography techniques have been introduced for the efficient purification of the protein of interest [11].

Despite extensive research and the development of new methodologies to produce and purify the recombinant therapeutic proteins, there are still hurdles and challenges with all expression systems. E. coli produces inclusion bodies and many mammalian cell types do not show the same results with the same recombinant protein [12]. So, appropriate features should be added to the expression systems to better improvise the recovery, production and purification of recombinant proteins.

Conflict of Interest

The author declares no conflict of interest.

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