

EXPANDING THE VECTOR TOOLKIT FOR COMPLEX RECOMBINANT PROTEIN EXPRESSION

Peter M O'Callaghan, Lonza Biologics
peter.ocallaghan@lonza.com
Andrew Racher, Lonza Biologics
Robert Young, Lonza Biologics

Key Words: Chinese hamster ovary cells, gene expression vectors, bi-specific antibodies

Gene expression vectors are the starting point for the manufacturing of recombinant protein therapeutics. Key performance criteria for an industrial vector system are speed, ease of assembly, and flexibility. As recombinant protein therapeutics become ever more complex and encompass increasingly diverse formats with multiple protein chains, it is essential for the gene expression technology platforms to evolve in-sync to facilitate cell line construction and manufacturing. Over the last couple of years, we have explored updates to the Lonza GS gene expression vector system, primarily to speed vector construction timelines but also to increase flexibility for complex proteins. This work has encompassed different vector assembly methodologies, as well as traditional cut-and-paste protocols. In this poster we present the results of this research and illustrate how relatively small changes to existing vector designs can have a big impact on performance. We show how different vector assembly methods can be used to provide solutions for specific protein formats and end user objectives. Furthermore, we show how strict vector design constraints can affect the performance of DNA cloning methods, and suggest how vector components can be updated to achieve further optimisations. This work contains lessons for the continuing evolution of DNA vectors in the face of the continuing revolution in recombinant therapeutic protein design.