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Seamless Scalability, Consistency and Quality of Transient Protein Production in CHO Cells By Using MaxCyte Flow Electroporation Technology

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Recombinant protein production often suffers from process inconsistencies as cell cultures are scaled up. High levels of process consistency and scalability are important not only for GMP stage manufacturing, but they are also critical for early stage R&D studies since good predictivity of any scale production can shorten timelines and minimize costs. There are many parameters that influence consistency of production during scale up. These include agitation rates, dissolved oxygen levels and pH. Consistency of production following transient gene expression (TGE) is further impacted by process variabilities that are inherent to many transient transfection methodologies. The aim of this study is to show how MaxCyte's flow electroporation technology (STX technology) can transiently produce therapeutic materials from milligram to gram scales quickly to support early to mid-stage drug development. We collected data on cell growth, viability and productivity post electroporation, demonstrating that this technology is highly consistent and scalable (from 0.5×10^6 to 2×10^{11} cells of transfected cells) Antibody titers from 1 g/L up to 2.7 g/L were achieved by transient gene expression in CHO-S cells. Furthermore, we showed that TGE materials have the comparable protein quality as proteins produced by a stable cell line. The high TGE productivity, product quality and scalability in CHO cells by using MaxCyte transfection technology can accelerate the drug development process and reduce the risk of drug evaluation and selection.