MaxCyte’s Flow Electroporation® Technology enables a single large cultured CHO cell line. The parental cell line and GSNi cells were electroporated with a plasmid encoding an Fc-fusion protein. Stable pools and a stable cell line were created and protein production assessed over a 17 day culture. Client met their goal of significantly increasing titer through the construction of a custom cell line and high performance of MaxCyte electroporation. Data courtesy of LakePharma.

Figure 4: Improved Stable Expression Using Custom CHO Cell Line. A suspension-adapted, serum-free CHO GSNi cell line was developed from a parental CHO-K1 cell. The parental cell line and GSNi cells were electroporated with a plasmid encoding an Fc-fusion protein. Stable pools and a stable cell line were created and protein production assessed over a 17 day culture. Client met their goal of significantly increasing titer through the construction of a custom cell line and high performance of MaxCyte electroporation. Data courtesy of LakePharma.

Accelerated Cell Recovery for Rapid Migration to Stable Expression

50% Faster CHO Cell Recovery

Figure 5: Rapid Recovery of Stable Pools Following MaxCyte Electroporation. CHO cells (proprietary cell line) were transfected via small-scale electroporation with varying concentrations of an antibody expression plasmid. Transfected cells were cultured in shake flasks and were subjected to MS1 selection beginning on the day of electroporation. STX transfected cells recovered from selection 7 days quicker than compared to cells transfected with the same plasmid using PEL.

Highly Efficient Construction of Custom Cell Line via Gene Editing

CRISPR/Cas9-mediated CHO Gene Integration

Figure 6: CRISPR-mediated Integration of Protein Expression Construct Within CHO Genome. CHO-S cells were transfected with 2 ratios of donor plasmid to Cas9 & gRNA. Selection was applied 72 hours post electroporation. Cells electroporated with either ratio of CRISPR components recovery within 11 days. 15 of 30 clones isolated from stable pools showed locus-specific integration by PCR.

Summary

- MaxCyte’s Flow Electroporation® Technology enables high efficiency, high viability transfection of any cell type, including a variety of CHO cell lines, for high titer transient expression of a range of antibodies & antibody-like molecules.
- The high performance transfection of custom CHO cells enables their use in earlier development activities improving in vivo translation and delaying the investment in stable cell line generation.
- MaxCyte’s delivery platform significantly outperforms other transfection methods including chemical and lipid-based methods.
- Media and feed strategy flexibility enables large improvements in productivity and reduction in consumable costs.
- MaxCyte’s delivery platform generates high quality stable pools that quickly recover from selection greatly reducing development timelines.
- MaxCyte electroporation efficiently delivers CRISPR components to CHO cells for engineering custom CHO production cell lines.
- MaxCyte STX scalability enables a single large-scale electroporation for use in DGE studies and/or simultaneous transient expression and stable cell generation for improved transient productivity & accelerated migration to stable expression.