COMPARISON OF TRANSFECTION METHODS ON YIELD OF RECOMBINANT HUMAN IgG1 Fc

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Monoclonal antibodies (mAbs) share many common structural features, so understanding how each part contributes to structural characteristics of the entire molecule may unveil ways to design better therapeutics. The Fc portion of a mAb enables purification via Protein A chromatography and controls antibody effector functions (e.g. antibody dependent cell-mediated cytotoxicity, complement dependent cytotoxicity) depending on glycoform presence and identity. Characterizing both aglycosylated and glycosylated Fc and their contributions to antibody stability requires adequate recombinant protein yield from mammalian cell culture.

Mammalian cell cultures (e.g. CHO and HEK) used for protein production are either stable or transiently transfected, and lipofection and polyfection represent the most common methods of performing the transfection. Here, we determine head-to-head comparison of the yields of recombinant Fc protein from transient/stable and lipid/polymer mediated transfections in 30 mL scale cultures of HEK Freestyle 293 and ATCC HEK293 cells. Heterogeneous populations of stably transfected HEK cells under Zeocin™ antibiotic selection produced 5-10 mg/L yields, but further passages of these cells reduced overall production. The proprietary cationic lipid formulations resulted in the highest overall Fc amounts (5-15 mg/L) in transiently transfected cells, but PEI mediated polyfection (yielding >2 mg/L) could offer greater overall cost efficiency and scalability under similar conditions.