Spring 5-10-2016

Improving the productivity and product quality of antibodies expressed from a CHO transient system

Athena Wong
Genentech

Improving the productivity and product quality of antibodies expressed from a CHO transient system

Athena Wong, Genentech, S. San Francisco

Transient transfection of CHO cells is a widely used tool to express recombinant proteins for non-GLP preclinical studies due to the system's ability to rapidly produce proteins of similar product quality to CHO stable cell lines. Our high throughput CHO transient transfection process allows for efficient generation of milligram to multi-gram amounts of protein from small scale automated 96-deep well plates and tubespins to large scale 100L bioreactors. In this work, we present a case study describing the influence of media components on PEI-mediated CHO transfections. Given the dependence of PEI transfection on electrostatic interactions for formation and cell internalization of PEI:DNA complexes, the basal media composition significantly affects transfection productivity. We found that while higher iron levels in the basal media inhibited transfection titers, copper and zinc had minimal impact. As transfection efficiency is more sensitive to changes in basal media composition, we explored altering the batch feed composition for further process improvements. The addition of DMSO to the batch feed further increased productivity. Supplementing the feed with carnosine, an antioxidant and metal ion chelator, reduced huIgG1 afucosylation levels. This addition allowed us to achieve a comparable range of afucosylated antibody to our stable CHO cell lines. Our data demonstrates that modifying production and feed medium components in our CHO transfection process can provide benefits towards increasing yields and modulating product quality.