

PLATFORM BASED SCREENING STRATEGIES THAT DELIVER RELIABLE AND HIGH QUALITY CONTINUOUS BIOMANUFACTURING PROCESSES

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The challenge during mammalian cell line and upstream process development is to identify and isolate stable, high expressing cell lines producing product with the appropriate critical product quality attributes rapidly, reproducibly and with relative ease. Current platform processes are based on a defined set of hierarchical screening strategies utilised to identify key cellular performance criteria required for fed-batch culture (Porter et al 2010a,b).

The application of continuous biomanufacturing principles has introduced a paradigm shift, due to their inherent advantage of higher productivity which can facilitate the implementation of smaller process equipment and result in cost-effective, lean and agile manufacturing facilities.

However, as we move from fed-batch to continuous manufacturing we must re-evaluate and leverage the correct platform technologies (host cell line, expression vector, cell line development process, cell culture media/feed, process control) to rapidly identify the correct cellular performance criteria that are important for continuous biomanufacturing processes. Furthermore, whereas the adoption of robust and reproducible platform processes have been widely adopted for fed-batch processes, optimal upstream continuous processes performance still largely relies on the optimisation of key bioprocess parameters which are optimised in an ad-hoc manner during process development. To increase speed-to-clinic we show the application of both a new cell line development and continuous upstream production platform methodology which has been successfully utilised to establish reliable and high quality continuous upstream biomanufacturing processes for multiple CHO-DG44 derived cell lines and recombinant monoclonal antibody products.

References

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