EVALUATING OPTIONS OBJECTIVELY – RESISTING THE 'PURIST' APPROACH TO ARRIVE AT THE MOST PRODUCTIVE, ROBUST, AND PRACTICALLY IMPLEMENTABLE PERFUSION UTILIZING PROCESSES

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Over the past three years our groups have been working collaboratively to help provide and define options for future high-intensity biopharmaceutical production processes – aka the Next-Generation MAb manufacturing process. Using perfusion/cell retention and a number of comparator cell lines generated using different expression systems and different proprietary media compositions, our presentation will focus on the comparison of different process options that move us closer to a high volumetric productivity yet practically implementable mode of bioreactor operation.

In our experimental exploration of design options we evaluated what might be defined as high-density continuous steady-state perfusion, a continuous linked N-1 perfusion to CSTR (continuous-flow stirred tank reactor) option, a high-intensity low-volume perfusion process (inherently acknowledged to be non-steady-state), and a short-duration hybrid perfusion fed-batch process (inherently designed to fit in existing infrastructure and batch time slots). We continue to attempt to improve upon the above mention modalities to try to design a robust continuous process that balances obtaining a "steady-state like" high viability and low bioreactor product retention. After a thorough evaluation of the results and consideration of large scale operations we will explain how we have come to focus our current development activities for cGMP implementation on a modality of continuous culture that will dovetail well with a continuous downstream and yield the highest volumetric productivity.