**Development of an Automated Perfusion Bioreactor ‘Ambr® 250 Perfusion’.**

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In recent years a strong trend towards intensified and continuous biopharmaceutical processing has gathered momentum, enabled by key cell culture technologies such as ATF and TFF. However, small-scale application has been limited to traditional benchtop bioreactor formats that are manually intensive, relatively low throughput and costly to operate. Automated high throughput, single-use, mini bioreactor systems with new capabilities to support perfusion culture, including new ambr 15 capability and the novel ‘ambr 250 perfusion’, can facilitate and significantly accelerate an industry wide transition to intensified and continuous perfusion cell culture processes.

Working in close collaboration with biopharm industry development partners, the design of the ‘ambr 250 high throughput’ bioreactor system has been modified to include hardware, software and single use components required to operate up to 24 parallel bioreactors with ATF or TFF cell retention modes. Iterative prototype testing with biopharm industry development partners has resulted in a novel ambr 250 system design, shown to be capable of operating for extended culture durations and supporting high cell densities.

Technical description and cell culture results presented for ‘ambr 250 perfusion’ outline system capability for intensified cell culture applications. Case studies will be presented on the utility of new ambr 15 system features for perfusion mimic applications, together with a range of industry case studies and novel performance data for the new ‘ambr 250 perfusion’ system. As previously established with ambr 250 for fed-batch processes, ‘ambr 250 perfusion’ has the potential to provide the biopharm industry with a step change in perfusion process development capacity, enabling implementation of DoE based approaches for perfusion process optimization and characterization.