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# Advances in Bioreactor Scale-Down Modeling Using Process Analytical Technology

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Poster Title:

**Advances in Bioreactor Scale-Down Modeling Using Process Analytical Technology (PAT)**

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Poster Abstract

A bioreactor scale-down model is an essential element in process development and commercialization. In this poster presentation, key strategies in bioreactor scale-down model development and characterization will be discussed. A 4-Liter bioreactor scale-down model was developed to emulate a 15,000-Liter commercial scale bioreactor. Mass transfer characterization studies were conducted for the 15,000-Liter bioreactor, from which the results were summarized and utilized to guide scale-down model development / characterization. Case studies are shown where scale-down model representativeness is enhanced by implementing PAT. Specifically, automated dissolved carbon dioxide (pCO<sub>2</sub>) control was implemented during scale-down model development in order to establish a more representative scale-down model. Establishing pCO<sub>2</sub> control with a feedback control loop significantly enhanced the ability of the scale-down bioreactor model to perform comparably with the 15,000 L commercial bioreactor.