Advances in Bioreactor Scale-Down Modeling Using Process Analytical Technology

LiYing Yang  
MedImmune

Jimmy Liu  
University of Maryland

Benjamin D'Alessio  
Lonza

Follow this and additional works at: http://dc.engconfintl.org/cellculture_xv

Part of the Biomedical Engineering and Bioengineering Commons

Recommended Citation


This Abstract is brought to you for free and open access by the Proceedings at ECI Digital Archives. It has been accepted for inclusion in Cell Culture Engineering XV by an authorized administrator of ECI Digital Archives. For more information, please contact franco@bepress.com.
Poster Title:
Advances in Bioreactor Scale-Down Modeling Using Process Analytical Technology (PAT)

Author:
LiYing Yang¹, Jimmy Liu², Benjamin D’Alessio³

Author Affiliation:
¹ MedImmune/ AstraZeneca Biologics, Frederick, MD
² University of Maryland
³ Lonza, Maryland

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 (pCO₂) control was implemented during scale-down model development in order to establish a more representative scale-down model. Establishing pCO₂ 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.