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Development of an adherent cell based virus production process in Mobius® sIngleuse bioreactor

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Abstract:

Cell culture production processes are being developed as an alternative to the egg-based influenza vaccine production. The egg based method is slow and is subject to avian influenza outbreaks which can leave the human population at risk. The cell culture derived method has several advantages over the egg-based production. It is a robust method which can produce a large volume of vaccine in a short period of time thereby reducing the risk of vaccine supply shortages. This presentation focuses on the development of an upstream MDCK cell based influenza A/WS/33 flu production process using Cytodex^3 microcarriers in a 3L Mobius® Single-Use stir tank bioreactor. Initial development of the cell based process was performed in 250mL Corning baffled shake flasks to evaluate microcarrier concentration, inoculation and cell growth. The developed process was then optimized for cell growth and virus production by evaluating process control parameters such as; pH, dissolved oxygen and agitation in the 3L Mobius® system. The developed process is capable of achieving peak cell densities of 3e6 cells/mL on 4 g/L of Cytodex^3 microcarriers with ~ 35,000HAU/mL of influenza virus.