ISKID: FROM INTEGRATED PILOT SCALE RUNS TO GMP IMPLEMENTATION APPROACH

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One of the most compelling business reasons for integrated processing is the ability to de-risk capital investment due to a significantly more productive process that takes less space and fewer campaigns to generate clinical and commercial material. Boehringer Ingelheim and Pfizer developed the iSKID, a fully integrated and automated system that hydraulically links the perfusion bioreactor with several downstream unit operations (2xProtein A columns, continuous viral inactivation, AEX in flow through mode, and SPTFF). The Protein A elution cycles are discrete and separated by >2hrs, allowing the ability to discard cycles that do not meet process specifications. The discreteness between product cycles and hydraulic linkage enables the sanitization between cycles for a robust bioburden control strategy. Each cycle is captured in a single use mixer (SUM), where the product is pooled in stable conditions until viral filtration, ultrafiltration/diafiltration and final filtration are performed in batch mode.

Identical iSKID prototypes at 100L scale were used at three different sites to generate product quality, process, and bioburden data from three different molecules. The data has been used to understand implementation gaps in GMP facilities and process platforms (CMC1/CMC2). In addition, the team identified specific items to present to the FDA's Emerging Technology Team (ETT). These items include our strategies for batch definition, microbial control, and process control. In this talk, we will use the data generated from the consistency runs to elaborate on the robustness of the process and touch upon the strategies to be presented to the ETT.