

The role of simulation and scheduling in analyzing, evaluating, and optimizing integrated biopharmaceutical process

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This presentation will review the state of the art in batch process simulation and scheduling tools and their applications in the design and optimization of integrated biopharmaceutical processes. Particular emphasis will be placed on issues of cycle time reduction and debottlenecking of multi-product facilities.

As we increase throughput in a plant, we run into bottlenecks that are related to either equipment or resources (e.g., utilities, labor, etc.). Size bottlenecks are equipment or resources that, due to capacity constraints, limit the amount of product produced per batch. Time bottlenecks are equipment units that limit the number of batches that can be processed per year or campaign. A systematic methodology will be presented for identifying and eliminating size and time bottlenecks that limit throughput in single and multi-product facilities.

Availability of resources are considered. Our methodology and its computer implementation will illustrate how to systematically identify and eliminate such bottlenecks. Cost analysis results for the various debottlenecking scenarios will also be presented.