Agent-based Multiscale Simulation Framework for Cell Therapy Manufacturing (#8295)

A multiscale simulation framework for the manufacturing facility and supply chain of autologous cell therapies.

Georgia Tech inventors have created a multiscale simulation framework that integrates novel supply chain system modeling algorithms, methods, and tools. The simulation includes a single facility model and a system-wide network model. Unique challenges of the cell therapy industry are analyzed and addressed in the simulation framework. Decision-supporting tools can be developed based on this framework to explore "what-if" manufacturing and supply chain scenarios of importance to various cell therapy stakeholder groups. This simulation framework will be useful in understanding the impact of possible manufacturing and supply chain strategies, policies, regulations, and standards informing strategies to increase patient access to cell therapy.

Benefits/Advantages

- Able to model and provide more accurate behavior of manufacturing and supply chain operation over the entire supply chain

Potential Commercial Applications

- Decision support tools for cell therapy manufacturers

Background/Context for This Invention

Autologous cell therapy (AuCT) is an emerging therapeutic treatment that is undergoing transformation from laboratory- to industry-scale manufacturing with recent regulatory approvals. AuCT has demonstrated appropriate safety and efficacy and received regulatory approval in a small number of cancers and shown promising results in clinical trials for a number of other indications, including blood disorders and autoimmune diseases. Various challenges facing the complex AuCT manufacturing and supply chain process hinder the scale out and broader application of this highly potent treatment.

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