Robotic Automation of T Cell Generation for the Treatment of Acute Myeloid Leukemia (AML)

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Introduction
AML is a malignant neoplasm of myeloid lineage arising in the bone marrow and outgrowing normal hematopoietic elements. In 2021, there will be estimated 20,000 new cases of AML with ~11,000 deaths.

Objectives
- To decrease the number of manufacturing interventions and the complexity of the process
- To develop a novel GMP-compatible robotic system to improve manufacturing throughput of cellular products

Methods
To commercialize the mTAA therapy, the number of interventions and complexity of the manufacturing process needed to be reduced.

Results
New Manufacturing Process Relies on Reduced Number of Interventions and Yields Products With Greater Antigen Specificity and Diversity Compared to Old Process

Conclusion
- We simplified the manufacturing process of mTAA-specific T cells by decreasing the number of interventions and shortening culture time, allowing automation.
- The ABB robotic assistant was more precise and accurate than human operators in pipetting liquid, a critical step in cell therapy manufacturing, suggesting that the robot could revolutionize immunotherapy manufacturing worldwide.