Late-Breaking Abstracts

Biomarkers, Immune Monitoring and Novel Technologies

1468 FIRST DATA READOUT OF STANDARDIZED TRANSCRIPTIONAL PROFILING FOR OPTIMIZING CELLULAR THERAPIES: A MULTI-CENTER PICI-NANOSTRING COLLABORATION

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Background The field of cellular therapy remains one of the most promising areas for the development of new cancer treatments. To make improvements, it is imperative to broadly understand cell therapy products at the molecular level and to identify factors that contribute to their safety and efficacy. NanoString and the Parker Institute for Cancer Immunotherapy (PICI) have established a ground-breaking collaboration to characterize up to 1,000 apheresis and cellular therapy infusion products with the primary goal of identifying molecular pathways and features that correlate with optimal cellular therapies.

Methods Using a large and diverse sample cohort collected from four (and eventually 8 in Phase II) PICI network Cell Therapy Centers, we are studying Gene Expression Profiles (GEPs) that correlate with optimal apheresis and downstream cellular products, identifying biomarkers and signatures for clinical response and toxicity. We are exploring both cancer-specific and general characteristics associated with effective chimeric antigen receptor (CAR) T cells. Samples are being characterized using the standardized set of genes included in the nCounter CAR-T Characterization Panel, which measures essential features of CAR-T products, including metabolic fitness, TCR diversity, toxicity, activation, persistence, exhaustion and cell type abundances, along with individual transgene expression.

Results We are presenting the initial phase of gene expression analysis for multiple CAR-T cell products across both primary and metastatic hematological and solid tumors. Meta-analysis will be performed using the aggregated set of data alongside individual site-specific analyses. We will explore associations between manufacturing conditions, gene expression and outcomes, and we will examine differences across cancer types and target types.

Conclusions This is the first data output for this one-of-a-kind study characterizing GEPs in CAR-T cells. We anticipate that this information will prove useful across many aspects of the development, manufacturing and clinical application of cellular therapies, and we hope that the findings will lead to improvements in the safety and efficacy of cell therapy products. Data from this project will be made publicly available to the scientific community.

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