



Directly Test Individual T Cell Function With Fewer Cells

Title: Directly Linking Single T Cell Phenotype and Function to Genotype on the Lightning™ System

Abstract: T cell therapies for cancer treatment are challenging to develop because of the complex mechanisms and cell interactions that underly T cell-mediated tumor killing. Current technologies rely on correlating phenotype, function, and gene expression based on experiments performed on different populations of T cells because no one platform is able to assess cell surface marker expression, cytokine secretion, and tumor cell killing activity of the same T cell and recover this cell for downstream genomic analysis. Here we share two use cases – CAR-T cell functional screening and TCR sequence recovery following functional assay – that demonstrate how the T Cell analysis capabilities on the Lightning optofluidic platform can be used to directly link T cell phenotype and function (IFN γ secretion and tumor cell killing) to genotype (TCR sequence recovery) at a single-cell level and on the same T cell, enabling deeper and more thorough characterization of how T cells mediate tumor cell death and potentially the development of more efficacious therapies.