Interrogating immune cell composition and function in patients with cancer is critical for making disease prognoses, monitoring clinical efficacy of tumor immunotherapies, identifying novel therapeutic targets, and discovering predictive biomarkers of disease. Effector cells such as NK cells and T cells can directly kill tumor cells via secretion or cell-surface expression of cytolytic proteins and modulate the immune response through costimulatory molecules. In multiple myeloma, malignant plasma cells accumulate in the bone marrow through clonal expansion, crowding out other cells and leading to anemia, renal insufficiency, immunosuppression, and increasing risk of multisystem organ damage if untreated. Cellular and antibody-mediated immunotherapeutic approaches, including CAR T cells and monoclonal antibodies targeting CD38, have been developed to treat multiple myeloma. Since NK cells can also indirectly impact CAR T cell or antibody-based immunotherapies, characterizing these cells using optimized and reproducible assays is critical.

CyTOF® is a high-plex flow cytometry technology that uses metal-isotope-tagged antibodies to probe cellular phenotypes and functions. In contrast to fluorescence-based conventional and spectral flow cytometry, CyTOF experimental workflows are streamlined because autofluorescence is not an issue and signal spillover is minimal, allowing rapid design and application of 40-plus-marker panels. To expand on the increasing utility of the 30-marker Maxpar® Direct™ Immune Profiling Assay™ (Maxpar Direct Assay), we developed 9 add-on Expansion Panels for deeper phenotyping of specific cell types and activation states, including panels designed to characterize ex vivo and activated myeloid cells, T cells, and NK cells, by adding markers such as CD181, NKP30, NKP46, PD-1, NKG2A, TIGIT, OX40, TIGIT, CD69, PD-1, Tim-3, ICOS, 4-1BB, IL-2, TNF?, IFN?, CD107a, perforin, and granzyme B to enable deep immunoprofiling of multiple myeloma PBMC.