Multiparameter flow cytometry is a powerful analytical and preparative tool.

It enables the rapid measurement of multiple physical and chemical characteristics of individual cells or particles as they flow past beams of laser light in a focused fluid stream. Using flow cytometry, defined cell types can be identified within mixed cell populations and studied separately or within the context of functional intercellular interactions. Flow cytometers that provide cell sorting capabilities can identify specific cell types and physically separate them in bulk or individually (e.g., through indexed cell sorting, into different groups for further study.

Flow cytometry is often applied to scrutinizing the types and levels of molecules expressed on the cell surface or within various intracellular compartments. The simultaneous measurement of multiple fluorescence parameters allows detailed analyses of coexpressed structural, receptor, signaling, and effector molecules, as well as information-containing nucleic acids. By enabling high-resolution identification and quantification of cell types and their functional characteristics, flow cytometry has become an invaluable tool for unraveling the complexities of the immune system. Well-characterized molecules are probed individually or in panels as immunophenotypic biomarkers associated with particular cell types in normal or disease states. Within each cell type of interest, insight into cellular function can be obtained by measuring markers associated with cell signaling, cell cycle status, effector function, and other cell fates [1)].

1)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3659255/