

Molecular Cytometry: New Approaches to the Analysis of Molecular Assemblies

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Over the past 30 years, flow cytometry has matured from an experimental fluorescence detection approach to an established workhorse in the fields of immunology and cell proliferation, with thousands of instruments installed in research and clinical laboratories. For the past several years, we have been exploiting the features of flow cytometry to investigate the mechanisms of macromolecular assembly and function. Using cells to study *in situ* phenomenon, and microspheres as solid supports for *in vitro* analysis, we have developed powerful new approaches to study molecular interactions. These applications are driving the development of several new instrument capabilities, including stopped flow mixing, dynamic temperature control, and spectral analysis capabilities. I will illustrate the instrumentation and application development through studies of ligand-receptor and enzyme-substrate interactions, as well as in new applications in genomics, proteomics, and drug discovery.