

Imaging Cytometry: An Expanding Role in Biomedical Imaging Analysis

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Bill Telford received his PhD in microbiology from Michigan State University in 1994, where his laboratory developed some of the earliest techniques for flow cytometric detection of apoptosis. He received his postdoctoral training in immunology at The University of Michigan Medical School and was appointed assistant scientist at the Hospital for Special Surgery in New York City from 1997 to 1999. Dr. Telford became a staff scientist at the National Cancer Institute, National Institutes of Health in 1999, and is currently the director of the flow cytometry core laboratory in the NCI Experimental Transplantation and Immunology Branch. Dr. Telford's main research interests include instrument development, particularly in the area of novel solid state laser integration into flow cytometers; flow cytometric stem cell detection and characterization; and functional characterization of early apoptosis by flow and image cytometry.

Abstract

Imaging cytometry (also termed laser scanning cytometry) represents a unique hybrid technology between flow cytometry and traditional fluorescent microscopy. Imaging cytometers analyze the light scattering and fluorescent properties of biological specimens like a flow cytometer, but also simultaneously collect correlated quantitative images of the cells. This powerful technique is a dramatic expansion of traditional cytometric analysis, allowing the cell images and their morphological and structural information to become a cytometric parameter, like forward scatter or fluorescence. In this introductory talk, we will discuss the theory and practice of imaging cytometry, and provide a general overview of the technology available to biomedical scientists. We will also cover a wide variety of applications for this technology, from individual cells to intact tissues and whole organisms.