Workshop: Designing QIC Experiments

Presenter: William Telford, PhD, Director, Flow Cytometry Core Laboratory, National Cancer Institute, National Institutes of Health, Bethesda, MD

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

This laboratory will be a basic introduction to laser scanning cytometry. We will cover experimental design and setup, choosing appropriate fluorochromes and combining them for multicolor analysis. We will then analyze three experiments designed to demonstrate the key aspects of LSC operation. In the first, we will look at mouse lymphoma cells labeled simultaneously for DNA cell cycle and two intracellular cell cycle markers (i.e., cyclins, cyclin-dependent kinases or histones). This experiment will introduce users to basic instrument operation and the concept of contouring. In the second experiment, we will analyze small numbers of human PBMCs labeled with antibodies against multiple cell-surface markers. These samples will demonstrate issues associated with multicolor analysis, including compensation. Finally, we will analyze adherent cells expressing multiple fluorescent proteins. These samples will illustrate the challenges associated with analyzing cells with unusual shapes in confluent cell culture, demonstrating the use of specialized algorithms for dealing with irregular and closely spaced objects. This laboratory will give the basic grounding in concepts required to participate in the subsequent Track 1 workshops.