

Reliable Lab Solutions

ESSENTIAL CYTOMETRY METHODS

Edited by

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Cytometry is broadly defined as the measurement and characterization of cells and cellular constituents. It comprises of flow cytometry and image-assisted cytometry branches which collectively encompass a broad range of analytical procedures and instrumentation designed to analyze and sort individual cells and cell populations. Complementing the molecular biology analytical tools cytometry is the key methodology in studies of biological properties of the cell. Its use in cell biology was the driving force for the progress in revealing mechanisms of life processes at the molecular and organismic level. Cytometry is also widely used in clinical settings primarily for diagnostic purposes. It is indispensable in immunology where it is applied for characterizing cell immunophenotype in various diseases and thereby directing the therapy. Its use in pharmacology revolutionized the means for new drugs development and testing. In oncology it provides invaluable information for assessment of cancer malignancy and treatment. The identification and sorting of stem cells now entirely depends on cytometry. The advances in radiobiology, microbiology, biotechnology and environmental sciences were also greatly aided by cytometry.

This volume, as part of the **Reliable Lab Solutions** series, brings together chapters from six volumes of **Methods in Cell Biology** that were specifically dedicated to cytometry. The chapters have been selected by the editors and updated, when possible, by their original authors and the editors, providing scientists in the field with a handy compilation of time-tested methods to use at the bench. Each chapter is comprised of a short review of the field and an easy-to-follow set of protocols that enable even the least experienced researchers to successfully establish the techniques in their laboratories. Comprehensive and clear step-by-step description of the methods and outlining of potential difficulties and pitfalls guides the reader through the challenges of the field and provides essential tools for the investigator.

Cover Image: The painting on the cover is from portfolio of the artist Julie Newdell who takes an inspiration from discoveries in science and often modifies scientific images to merge them with themes from ancient mythology. Her paintings can be found on the covers of *Nature*, *Cell*, *EMBO J.* and other high-impact journals. This painting is from the series of "Spindles of Necessity" presenting different stages of mitosis within the context of Greek mythology. As she defines: "The souls (chromosomes) are now at the opposite ends of the cell — a set for each side. The reformation of the cell nuclei are echoed by the rising moon and sun. As the cell prepares to rip apart, it pinches dramatically at the waist." The complete caption of this and other paintings of the series can be found through: <http://www.brushwithscience.com/Winter2005/Mitosis.html>



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