Flow Cytometry Protocols

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Thermogenic Fat

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Single Cell Protein Analysis Springer Science & Business Media
This second edition provides updated and new chapters to build on and extend the strengths of the first edition. Chapters guide readers through basic biology of basophils, obtaining the cells by purification, culture of stem cells progenitors, peripheral CD34+ stem cell-derived mast cells, basophils from CD34+ progenitors, diagnostic applications, gene expression patterns in basophils, roles of basophils in different asthma phenotypes, knockout, and disease models. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists

of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Basophils and Mast Cells: Methods and Protocols, Second Edition aims to ensure successful results in the further study of this vital field.

Current Protocols in Immunology Humana Press

This volume presents the latest collection of immunophenotypic techniques and applications used in research and clinical settings. Chapters in this book cover topics such as constructions of high dimensions fluorescence and mass cytometry panels; fluorescence barcoding; using dried or lyophilized reagents; and immunophenotypic examples of specific cell types. The book concludes with a discussion on the critical roles of quality control and immunophenotyping in the clinical environment. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and comprehensive, Immunophenotyping: Methods and Protocols is a valuable resource for any researchers,

clinician, or scientist interested in learning more about this evolving field.
Mass Cytometry Methods in Molecular Biology
The aim of Apoptosis and Cancer is to describe the performance of contemporary techniques for studying the biology of apoptosis and its role in cancer. The protocols described will aid both the academic laboratory interested in further characterizing the mechanisms of apoptosis, as well as the industry laboratory, aimed at identifying new target molecules or screening for new compounds with potential clinical use.
High Throughput Screening Humana
This volume explores the scope of the cellular redox analysis and the importance of not being limited by frequently changing and evolving technology. The chapters in this book cover a wide range of topics such as redox components in animal and plant cells and the role of reactive oxygen species, reactive nitrogen species, and hydrogen sulphide in cell signaling; measuring modifications using Flow Cytometry, ELISA assays, and Western blot analysis; measurement of oxidative stress in mitochondira and biological systems; and the use of the genetically encoded fluorescent probe HyPer. Written in the highly successful Methods in Molecular Biology series format,

chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and informative, Redox-Mediated Signal Transduction: Methods and Protocols, Second Edition is a valuable resource for both novice and expert researchers who want to expand their studies into new areas and new systems in the evolving redox field. *Schmidtea Mediterranea* Humana Current Protocols in Immunology is a three-volume looseleaf manual that provides comprehensive coverage of immunological methods from classic to the most cutting edge, including antibody detection and preparation, assays for functional activities of mouse and human cells involved in immune responses, assays for cytokines and their receptors, isolation and analysis of proteins and peptides, biochemistry of cell activation, molecular immunology, and animal models of autoimmune and inflammatory diseases. Carefully edited, step-by-step protocols replete with material lists, expert commentaries, and safety and troubleshooting tips ensure that you can duplicate the experimental results in your own laboratory. Bimonthly updates,

which are filed into the looseleaf, keep the set current with the latest developments in immunology methods. The initial purchase includes one year of updates and then subscribers may renew their annual subscriptions. Current Protocols publishes a family of laboratory manuals for bioscientists, including Molecular Biology, Human Genetics, Protein Science, Cytometry, Cell Biology, Neuroscience, Pharmacology, and Toxicology.

T Cell Protocols

Springer Science & Business Media

A contribution towards making this increasingly valuable technology accessible to researchers, including the students, post-doctoral scholars, and technicians gathering the knowledge inherent in this integration between analysis and physical isolation/purification methodologies. A step-by-step approach to the methodology for measuring various attributes demonstrated in the particular cells of interest is provided, as is a myriad of resources to fuel the curiosity and answer questions of both new and adept users. This book stems from the editors'experiences managing flow cytometry/cell sorting core facilities for the emerging researchers, in particular in developmental, cellular, and molecular biology.

Monoclonal Antibodies

Springer Science &

Business Media
The field of cell cycle regulation is based on the observation that the life cycle of a cell progresses through several distinct phases, G1, M, S, and G2, occurring in a well-defined temporal order. Details of the mechanisms involved are rapidly emerging and appear extraordinarily complex. Furthermore, not only is the order of the phases important, but in normal eukaryotic cells one phase will not begin unless the prior phase is completed successfully. Che- point control mechanisms are essentially surveillance systems that monitor the events in each phase, and assure that the cell does not progress prematurely to the next phase. If conditions are such that the cell is not ready to progress—for example, because of incomplete DNA replication in S or DNA damage that may interfere with chromosome segregation in M—a transient delay in cell cycle progression will occur. Once the inducing event is properly handled— for example, DNA replication is no longer blocked or damaged DNA is repaired—cell cycle progression continues. Checkpoint controls have recently been the focus of intense study by investigators interested in mechanisms that regulate the cell cycle. Furthermore, the relationship between checkpoint c- trol and

carcinogenesis has additionally enhanced interest in these cell cycle regulatory pathways. It is clear that cancer cells often lack these checkpoints and exhibit genomic instability as a result. Moreover, several tumor suppressor genes participate in checkpoint control, and alterations in these genes are as- ciated with genomic instability as well as the development of cancer.
Springer
Flow cytometry has evolved since the 1940s into a multidisciplinary field incorporating aspects of laser technology, fluid dynamics, electronics, optics, computer science, physics, chemistry, biology, and mathematics. Innovations in instrumentation, development of small lasers, discovery of new fluorochromes/fluorescent proteins, and implementation of novel methodologies have all contributed to the recent rapid expansion of flow cytometry applications. In this thoroughly revised and updated second edition of Flow Cytometry Protocols, time-proven as well as cutting-edge methods are clearly and comprehensively presented by leading experimentalists. In addition to being a valuable reference manual for experienced flow cytometrists, the editors expect this authoritative up-to-date collection to prove useful to investigators

in all areas of the biological and biomedical sciences who are new to the subject. The introductory chapter provides an eloquent synopsis of the principles and diverse uses of flow cytometry, beginning with a historical perspective and ending with a view to the future. Chapters 2–22 contain step-by-step protocols of highly practical and state-of-the-art techniques. Detailed instructions and helpful tips on experimental design, as well as selection of reagents and data analysis tools, will allow researchers to readily carry out flow cytometric investigations ranging from traditional phenotypic characterizations to emerging genomics and proteomics applications. Complementing these instructive protocols is a chapter that provides a preview of the next generation of solid-state lasers, and one that describes a rapid means to validate containment of infectious aerosols generated during high-speed sorting (Chapters 23–24).

Flow Cytometry in Medical Microbiology
Humana

Current Protocols in Cytometry (CPC), published in affiliation with the International Society for Analytical Cytology, features carefully edited flow and image cytometry methods provided by leading laboratories from around the world. All methods included in the one-volume looseleaf manual are

rigorously tested and proven before being selected for CPC. Carefully edited, step-by-step protocols replete with material lists, expert commentaries, and safety and troubleshooting tips ensure that you can duplicate the experimental results in your own laboratory. This publication also includes extensive coverage of cytometry instrumentation, safety and quality control, and data processing and analysis. Quarterly updates, which are filed into the looseleaf, keep the set current with the latest developments in cytometry methods. The initial purchase includes one year of updates and then subscribers may renew their annual subscriptions. Current Protocols publishes a family of laboratory manuals for bioscientists, including Molecular Biology, Immunology, Human Genetics, Protein Science, Cell Biology, Neuroscience, Pharmacology, and Toxicology.

Spectral and Imaging Cytometry Humana B-lymphocyte development and function remains an exciting area of research for those interested in the physiology and pathology of the immune system in higher animals. While recent advances in genetics and cellular and molecular biology have provided a large spectrum of powerful new experimental tools in this field, it is both time consuming and

often very difficult for a student or just any bench-side worker to identify a reliable experimental protocol in the ocean of the literature. The aim of B Cell Protocols is to provide a collection of diverse protocols ranging from the latest inventions and applications to some classic, but still frequently used methods in B-cell biology. The authors of the various chapters are all highly qualified scientists who are either the inventors or expert users of these methods. Their extensive experience in mastering a particular method provides not only the step-by-step details of a reproducible protocol, but also useful troubleshooting tips that readers will appreciate in their daily work. We hope that this book will be helpful for both beginning and experienced researchers in the field in designing or modifying an experimental approach, and exploring a biological question from multiple angles.

Current Protocols in Cytometry Current Protocols

In Flow Cytometry Protocols, leading researchers and experimenters update the complex and technically sophisticated field of flow cytometry with detailed accounts of their many new, improved, and well-tested protocols and applications. Among the cutting-edge methods presented

here are techniques for the detection of terminal transferase ion leukemia, intracellular cytokines, intracellular/intranucle ar antigens in leukemia and tumors, and cyclins. Protocols for performing functional studies include methods for assessing viability, transmembrane potential, oxidative metabolism, environmental particulate uptake, drug resistance, and cellular pharmacokinetics. The methods for examining DNA address cell cycle analysis, DNA/RNA analysis of solid malignancies, solid-tumor DNA ploidy analysis, apoptosis, and a method that combines FISH with flow cytometry. Advanced methods for chromosome sorting and 5-6 color analysis are also detailed. Flow Cytometry Protocols contains methods that take advantage of the recently developed instrumentation and the vast array of novel probes that have led to advances in the field of flow cytometry, as well as to significantly improved standard methods. This eminently practical new book will play a key role in bringing researchers up-to-date in this unique and productive technology.

Regulatory B Cells

Springer Science & Business Media

This second edition volume expands on the previous edition with discussions on the latest approaches used in the spectral cytometry field. Beginning with a brief

history of spectral cytometry development, this book continues with a section addressing new protocols in different areas of imaging cytometry based on the unique technology of Imagestream and also introduces FlowCam – cytometer with capabilities of analyzing phytoplankton and zooplankton. Written for the highly successful Methods in Molecular Biology series, chapters include brief introductions to their respective topics, complete lists of the materials and reagents necessary, and reproducible laboratory protocols with tips on troubleshooting and recommendations. Cutting-edge and thorough, Spectral and Imaging Flow Cytometry: Methods and Protocols, Second Edition is a valuable resources for beginners and professionals interested in learning more about this developing field. Chapters 1, 2, and 5 are available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.
Current Protocols in Cytometry Elsevier
This volume presents a collection of protocols that describe methodologies to study thermogenic fat biology from various angles. This book is divided into 2 parts. Part 1 focuses on establishing in vitro culture systems. The chapters in this section introduce techniques on how to isolate,

culture, and differentiate primary fat cells from both laboratory mice and humans. This part also presents flow cytometry methods to isolate various subpopulations of precursors within the stromal vascular fraction of the adipose tissue, which contains both preadipocytes and immune cells. Part 2 introduces multiple means to genetically manipulate and evaluate brown and beige fat in vivo. The chapters in this section explore methods on bioenergetics analyses both in vitro and in vivo. They also cover how to evaluate thermogenic fat contents and activity in humans, how to culture these cells though interdisciplinary approaches, and how to use thermogenic fat cell lines to carry out drug screens. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Thorough and cutting-edge, Thermogenic Fat: Methods and Protocols is a valuable resource for both experts and novices who are interested in learning assays and investigating brown and beige fat functions.

Basophils and Mast Cells Humana

This first edition volume demystifies the

complex topic of flow cytometry by providing detailed explanations and nearly 120 figures to help novice flow cytometry users learn and understand the bedrock principles necessary to perform basic flow cytometry experiments correctly. The book divides the topic of flow cytometry into easy to understand sections and covers topics such as the physics behind flow cytometry, flow cytometry lingo, designing flow cytometry experiments and choosing appropriate fluorochromes, compensation, sample preparation and controls and ways to assess cellular function using a variety of flow cytometry assays. Written as a series of chapters whose concepts sequentially build off one another, using the list of materials contained within each section along with the readily reproducible laboratory protocols and tips on troubleshooting that are included, readers should be able to reproduce the data figures presented throughout the book on their way to mastering sound basic flow cytometry techniques. Easy to understand and comprehensive, Flow Cytometry Basics for the Non-Expert will be a valuable resource to novice flow cytometry users as well as experts in other biomedical research fields who need to familiarize themselves with a basic understanding of how to perform flow cytometry and

interpret flow cytometry data. This book is written for both scientists and non-scientists in academia, government, biotechnology, and medicine.

Natural Killer Cell Protocols Flow Cytometry Protocols Detailed descriptions of twenty commonly used protocols for the preparation of cells for flow cytometric analysis. Protocols are written by well-known scientists who taught in international flow cytometry workshops.

B Cell Protocols Springer Nature This volume explores the diversity in progenitor cell biology methods and uniquely describes techniques for isolating, generating, and characterizing progenitor cells from either tissue or embryonic stem cells. The chapters in this book cover topics such as isolating progenitor cells from sources including adipose tissue, blood, bone marrow, ear, gut, heart, pancreatic islets, and Whirton's jelly; deriving neural, pancreatic, and urothelial precursors from the embryonic stem cells; and culturing isolated islets in vitro to generate progenitor cells via epithelial-to-mesenchymal transition. This book also delves into digital droplet PCR; flow cytometry and cell sorting; mitochondrial assays; calcium ratiometric signaling; and 2D gel electrophoresis. Written in the highly successful Methods in

Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and thorough, Progenitor Cells: Methods and Protocols is a valuable resource for scientists and researchers interested in learning more about this evolving and diverse field.

Current Protocols in Cytometry Humana Press

This second edition provides new and updated chapters useful for the study of Regulatory B cells. Organized in four sections, chapters detail basic methods for the isolation and immunophenotypical analysis of these cells, experimental approaches for the ex vivo generation/expansion of IL-10 producing B cells, molecular biology techniques for the analysis of IL-10 expression and production, and animal models mimicking pathologic settings. Written in the highly successful Methods in Molecular Biology series format, chapters include an introduction to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, as well as tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge,

Regulatory B Cells: Methods and Protocols, Second Edition aims to be useful to the scientific community and serve to clarify some unsolved aspects of Regulatory B Cells research.

Progenitor Cells

Springer Science & Business Media

Flow Cytometry ProtocolsSpringer Science & Business Media

In Living Color

Humana

Helps the reader to learn about the derivation, characterization, and utility of epidermal stem cells; follow step-by-step instructions that ensure successful results; understand the utility of epidermal cells in regenerative medicine applications; and apply reproducible methods to study epidermal precursors and mature epidermal cells.

Phagocytosis and Phagosomes Humana

This second edition volume expands on the previous edition with an update on the broad spectrum of research models, techniques, and protocols used in laboratories by basic and clinical researchers. The chapters in this book are divided into two parts. Part One discusses the latest findings on the development and characterization of representative research models for chronic immune-based diseases and inflammation-associated cancers. Part Two covers biochemical, molecular, and cellular biological techniques

that are commonly used to dissect the molecular mechanisms and cellular processes that drive the pathogenesis of certain disease states. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and comprehensive, Inflammation and Cancer: Methods and Protocols, Second Edition is a valuable resource for those with a diverse range of laboratory-based experience, ranging from novice undergraduate students to established basic or clinical researchers who wish to diversify their existing portfolio of practical knowledge in the field.