expression of macrophage-related transcripts reflects cytometric analysis, additional groups of mice were sacrificed pre-DMM (baseline), and post-DMM at 4 and 8 weeks. CD11c+ (expressed by dendritic cells, monocytes and macrophages) cells were expressed as percent of the CD45+ population. iNOS (expressed by M1-type inflammatory cells) was detected with Microfluidics iNOSPE. Multicolor flow cytometry was performed and data analyzed with FlowJo software. After gating on single live cells, F4/80+ (general macrophage marker) and CD206-PE. Mesenchymal Stem Cell Derived Exosomes INTRODUCTION: Macrophage infiltration in the synovial membrane (SM) and intra-articular fat pads (FP) is common in osteoarthritis (OA) development, and can contribute to catabolic and anabolic cytokine and protease production, which contributes significantly to OA symptoms. However, whether macrophages are appropriate targets for therapy in OA is unclear, as macrophages can also promote tissue repair. The purpose of this study is to characterize the timeline and phenotype of macrophages in SM and FP in a translationally relevant murine model of post-traumatic OA. We hypothesized that by analyzing macrophage populations by two separate approaches, cellular phenotype and gene expression analysis, we could confirm the precise temporal role and characteristics of infiltrating macrophages while OA is developing. METHODS: All animal research was conducted with IACUC approval from the University of Pennsylvania and the CMC VA Medical Center. C57BL/6 male mice (10-12 wks old) were subjected to destabilization of medial meniscus (DMM) on the right hind leg, and the left hind leg was un-operated. Mice were sacrificed 4 and 8 weeks post-surgery, and SM/FP dissected for cellular analysis. Tissues from 4 knees were pooled, cells isolated enzymatically, and stained with the Live/Dead2122 Fixable Violet Dead Cell Stain Kit (Invitrogen) and the following antibodies: CD45-PerCP Cy5.5, CD11c-Super Bright 645, F4/80-APC, 1NOS-Alexa Fluor 488, CD206-PE. Multicolor flow cytometry was performed and data analyzed with FlowJo software. After gating on single live cells, F4/80+ (general macrophage marker) and CD206+ (expressed by M2 reparative macrophages) expression was measured. To determine whether gene expression of macrophage-related transcripts reflects cytometric analysis, additional groups of mice were sacrificed pre-DMM (baseline), and post-DMM at 4 and 8 weeks.
SN/FP tissues from 4 knees were dissected and pooled for each sample to obtain adequate mRNA. cDNA was synthesized by routine methods, and mRNA transcripts amplified using the QX200TM Droplet Digital PCR System (BioRad). Primers for macrophage markers (CD68, F4/80 and CD11c) as well as MI (iNOS, CCR7) and M2 macrophage products (CD206 and CD163) were used, and transcript levels were expressed relative to TATA-Box binding protein (TBP) transcript numbers. Gating on the CD45+ population, two main populations of cells were defined by F4/80 and CD11c expression: A CD11c+ F4/80− population (reflective of dendritic cell phenotype), and a CD11c− F4/80+ population (reflective of macrophage phenotype). Percentages of both populations were significantly increased in DMM-operated compared to un-operated joints at 4 weeks but not at 8 weeks (Fig IA&B, F4/80− CD11c+, DMM: 11.8±0.011% vs un-operated: 4.5±0.010; p=0.009, F4/80+ CD11c+, DMM: 15.2±0.021 vs un-operated: 4.6±0.012, p=0.017). Compared to the un-operated side, CD206+ macrophages (F4/80+ CD11c+) and dendritic cells (F4/80− CD11c+) were significantly lower proportionally in DMM-operated limbs at 4 weeks, and this trend was sustained at 8 weeks in the F4/80+ CD11c+ population (Fig IC). Percentage of iNOS + cells were slightly elevated in the F4/80+ CD11c+ macrophage population at 8 weeks (p=0.02) post-DMM, but overall numbers of cells were small. We next tested whether similar phenotypic changes post-DMM could be detected at the mRNA level. We measured multiple markers of macrophage lineage (F4/80, CD68, and CD11c) and phenotype (MI: iNOS, CCR7; M2: CD206, CD163) by qPCR. CD11c and CD68 expression levels were increased on the DMM-operated side at 4 weeks post-DMM compared to the un-operated side (CD11c: 9.8-fold higher; CD68: 9.7-fold higher than un-operated, all p

Tumor Immunology and Immunotherapy - Cellular Methods Part B This book provides an understanding on a large variety of related topics in fish biology. The further development on molecular and cellular biology and ecology leads to assimilate the newer scientific knowledge in this area. Leading research works from around the world are brought together in this book to produce a valuable source of reference for teachers, researcher, and advanced students of biological science. The first three chapters of this book give a general description of the complex biology of the immune response. Detailed descriptions were also included on understanding of cytokine regulation in teleost immune system. The second three chapters provide information on the environmental stressors on the responses of freshwater fish across molecular to population level. Then, the following two chapters review two special topics; the roles of the atrium and the ventricle across teleost species and the tracer methodologies on the measurements of carbohydrate metabolism. The last chapter discusses the variables that are involved in the feeding behavior of a predatory freshwater fish species.

Dendritic Cell Protocols The daily production of hundreds of billions of blood cells through the process of hematopoiesis is a remarkable feat of human physiology. Transport of oxygen to tissues, blood clotting, antibody- and cellular-mediated immunity, bone remodeling, and a host of other functions in the body are dependent on a properly functioning hematopoietic system. As a consequence, many pathological conditions are attributable to blood cell abnormalities, and a fair number of these are now clinically treatable as a direct result of hematopoietic research. Proliferation of hematopoietic stem cells, and their differentiation into the many different lineages of functional mature cells, is highly regulated and responsive to many environmental and physiological challenges. Our relatively advanced understanding of this stem cell system provides potentially important insights into the regulation of development in other tissues, many of which are now being acknowledged as stem cell-based, perhaps even into adulthood. The recent public and scientific fanfare following announcement of human embryonic stem cell studies suggests that stem cell research will continue to be a relevant and exciting topic.

Human Cell Culture Host Response to Biomaterials: The Impact of Host Response on Biomaterial Selection explains the various categories of biomaterials and their significance for clinical applications, focusing on the host response to each biomaterial. It is one of the first books to connect immunology and biomaterials with research. The book also explores the interplay between biomaterials and the immune environment, including the benefits of synthetic versus natural biomaterials, and the transition from simple to complex biomaterial solutions. Fields covered include, but are not limited to, orthopaedic surgery, dentistry, general surgery, neurosurgery, urology, and regenerative medicine. Explains the various categories of biomaterials and their significance for clinical applications Contains a range of extensive coverage, including, but not limited to, orthopedic, surgery, dental, general surgery, neurosurgery, lower urinary tract, and regenerative medicine Includes regulations regarding combination devices

Trends in Emerging Viral Infections of Swine This reference is a volume in the Handbook of Physiology, co-published with The American Physiological Society. Growth in knowledge about the microcirculation has been explosive with the field becoming fragmented into numerous subdisciplines and subspecialities. This volume pulls all of the critical information into one volume. Meticulously edited and reviewed. Benefit: Provides investigators a unique tool to explore the significance of their findings in the context of other aspects of the microcirculation. In this way, the updated edition has a direct role in helping to develop new pathways of research and scholarship. Highlights the explosive growth in knowledge about the microcirculation including the biology of nitric oxide synthase (NOS), endothelial cell signaling, angiogenesis, cell adhesion molecules, lymphocyte trafficking, ion channels and receptors, and propagated vasomotor responses. Benefit: Microcirculatory biology has become fragmented into numerous sub-disciplines and subspecialties, and these reference reintegrates the information in one volume

Autoantibodies and Cytokines Monocytes represent one of the major types of white blood cells in man which prevent infection by ingesting and killing invading pathogens and by releasing factors which stimulate and regulate lymphocytes. Monocytes "purify" the blood, removing immune complexes, mediating inflammatory responses, and initiating tissue repair. Human Monocytes represents an up-to-date, definitive account of this important cell. It covers the cells biochemical, immunological, and inflammatory functions and its role in many diseases, including asthma, atherosclerosis, rheumatoid arthritis, and AIDS.

Janeway's Immunobiology Objectives:Our aims were to analyze the immunomodulatory effects of a scorpion-venom derived antimicrobial peptide (AMP) ToAP2 on bone marrow-
derived murine dendritic cells (BMDCs) and macrophages (BMM) as well as during the interaction of these cells with Cryptococcus neoformans. Methods: Dendritic cells (BMDCs) and macrophages (BMM - M1-like) derived from the bone marrow of C57Bl/6 mice using GM-CSF (Lutz et al., 1999). We evaluated the potential cytotoxicity of the scorpion-derived antibiotic antimicrobial peptide ToAP2 to BMDCs and BMM cells by incubating the peptide, and the cultures supernatant were collected for cytokine production evaluation. The production of cytokines produced after the treatment of both cell types with two different concentrations of ToAP2 was evaluated by a multiplex assay that measured 14 different cytokines (TNF-α, INFγ, IL1α, IL1β, IL4, IL6, IL10, IL12 (p70), IL13)/chemokines (IP-10, MCP-1, MIP-1α, MIP-1b, MIP-2). Additionally, we assessed the potential effects of ToAP2 during the interaction of both cell types with C. neoformans H99. More specifically, we evaluated the phagocytosis of C. neoformans by BMDCs and BMM in the presence of ToAP2, and their cultures supernatant were collected for further analysis. Results: ToAP2 presented BMDCs and BMM cytotoxicity in concentrations above 2.5 μM in both cells. The cytokine/chemokine analysis of BMDCs and BMM stimulated with this peptide revealed a pro-inflammatory effect with increased production of the cytokines TNF-α, IL1α, IL6, and chemokines IP-10, MCP-1, MIP-1α, MIP-1b, MIP-2. The peptide also produced a decreased expression of IP-10, MCP-1, MIP-2 by BMM cells, especially at the lower concentration. Pre-incubation of BMDCs and BMM with ToAP2 also seems to increase the number of internalized C. neoformans in comparison with the control group for both cell types and to increase the percentage of phagocytosis in BMDCs cells. Conclusion: ANPs can be used in anti-fungal therapy acting not only as fungicidal/fungistatic molecules but also by helping the immune system to deal with fungal infections. Further characterization of ToAP immunomodulatory activity will help to better evaluate the full potential of ANPs in antifungal therapy.

Molecular Biology of the Cell Epidermal Langerhans Cells focuses on epidermal Langerhans cells (LCs) and the important role they play in the induction of contact hypersensitivity and graft rejection. This in-depth work discusses how these antigen-presenting cells are modulated by various physicochemical agents (such as UV light) and how they can be infected by the AIDS virus. It also reveals that cytokines mediate their development into potent T cell-stimulatory dendritic cells. This comprehensive review covers important experimental details and methods, and fascinating information on LCs. It also provides an overview of the immune system as it relates to the skin in health and disease. This up-to-date publication is an indispensable resource for all investigative and clinical dermatologists, as well as immunologists interested in antigen-presenting cells.

Immunometabolism This book provides a comprehensive overview of recent novel coronavirus (SARS-CoV-2) infection, their biology and associated challenges for their treatment and prevention of novel Coronavirus Disease 2019 (COVID-19). Discussing various aspects of COVID-19 infection, including global epidemiology, genome organization, immunophenotyping, transmission, vaccination, and control strategies. It highlights host-pathogen interactions, host immune response, and pathogen immune invasion strategies toward developing an immune intervention or preventive vaccine for COVID-19. An understanding of the topics covered in the book is imperative in the context of designing strategies to protect the human race from further losses and harm due to SARS-CoV-2 infection causing COVID-19.

Microcirculation The analysis and sorting of large numbers of cells with a fluorescence-activated cell sorter (FACS) was first achieved some 30 years ago. Since then, this technology has been rapidly developed and is used today in many laboratories. A Springer Lab Manual Review of the First Edition: "This is a most useful volume which will be a welcome addition for personal use and also for laboratories in a wide range of disciplines. Highly recommended." CYTOBIOS

Immunity and Tolerance This book examines the pleiotropic effects of ethanol in animal and cell culture models through a collection of detailed procedures written by experts in the field. Sections present clearly defined models of ethanol exposure, recent advances in the development of specific methodologies to mimic the impact of ethanol metabolism in cultured cells, and methodologies to investigate a variety of cells and tissues that are known to be disrupted by ethanol, amongst other topics.

Current Protocols in Immunology It covers all aspects of DC generation, function, survival and multitumor activity in the tumor environment both in vivo and in experimental in vitro systems. The goal in focusing on a spectrum of immune responses related to DC in cancer is to provide an extensive and expansive review rather than a collection of independent analyses from different authors. Specific topics to be covered include analysis of DC behavior in the tumor microenvironment, including
endogenous and exogenous DC, multiple DC populations, molecular pathways responsible for DC dysfunction, tumor-derived factors altering DC polarization and activation, mechanisms of DC alterations, and the role of DC in tumor escape from immune recognition and elimination. Furthermore, additional chapters provide extensive analysis of the impact of cancer therapy on the DC system and how aging impacts DC function in the tumor microenvironment. Finally, chapters are included examining strengths and pitfalls of current methodologies for generating DC from cancer patients for therapeutic purposes and on the role of tumor-mediated modulation of the DC system in cancer immunotherapy.

Macrophages and Dendritic Cells is now apparent that dendritic cells not only play important roles in the body's immune system through their complex interactions with T cells, B cells, and other cell types, but also possess distinct functional attributes that enable them to assume different roles in that system. In Dendritic Cell Protocols, Stephen P. Robinson, MD, PhD, and Andrew Stagg, PhD, have brought together a wide range of time-proven methods for studying these so-called veiled cells. Many of these readily reproducible techniques deal with the problem of obtaining sufficient dendritic cells for analysis, whether by isolation from a wide variety of tissues or from various progenitor cell populations. Other methods describe in step-by-step fashion the techniques commonly used for analyzing aspects of dendritic cells, ranging from cell migration to antigen uptake and T cell stimulation. Variant methods that have been successful in other laboratories have been included to expand experimental possibilities. In addition, a few techniques explore the practical challenges involved in using dendritic cells in a clinical setting to develop novel immunotherapeutics. State-of-the-art and highly practical, Dendritic Cell Protocols provides both experienced and novice investigators with powerful tools to illuminate the complex biology of these foundation cells—cells that shape the evolution of acquired immune responses, play important roles in innate immunity, and promise the development of powerful new immunotherapeutics.

Myeloid Cells in Health and Disease The mechanism of autoantibodies cannot be explained without the detail knowledge of cytokines and interferon. These active molecules of immunology are very much dependent on each other and their function cannot be completed without their interaction towards each other. Currently, this the most updated book on this subject that helps the readers/students to upgrade their knowledge by going through chapter by chapter. Contribution by the renowned authors across the globe makes this book really unique and consider as one of the most updated textbook on this subject. This book provides a comprehensive guide to the function and types of autoantibodies and cytokines in basic and clinical field.

Flow Cytometry and Cell Sorting Tumor Immunology and Immunotherapy - Cellular Methods Part B, Volume 632, the latest release in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. Topics covered include quantitation of calreticulin exposure associated with immunogenic cell death, Side-by-side comparisons of flow cytometry and immunochemistry for detection of calreticulin exposure in the course of immunogenic cell death, Quantitative determination of phagocytosis by bone marrow-derived dendritic cells via imaging flow cytometry, Cytofluorometric assessment of dendritic cell-mediated uptake of cancer cell apoptotic bodies, Methods to assess DC-dependent priming of T cell responses by dying cells, and more. Contains content written by authorities in the field Provides a comprehensive view on the topics covered Includes a high level of detail

Immune System Accessory Cells Many of the diseases of modern mankind involve either acute or chronic inflammation. Measuring Immunity integrates the current information available on biomarkers and surrogate assays into a single handbook. It highlights the principles behind various applications, gives a brief summary on how they are conducted and provides detailed and critical analyses of murine models of immunity, clinical trials, and tests to predict utility and benefit. Measuring Immunity is indispensable for scientists and clinicians interested in the clinical applications of modern immunobiology. * Defines which assays of immune function are helpful in the assessment of clinical disorders involving inflammation and immunity * Assesses the dynamics of cellular and soluble factors in the peripheral blood using modern techniques * Includes basic science foundations as well as the approaches currently applied

Immunomodulatory Effects Of A Scorpion-Venom Derived Antimicrobial Peptide During The Interaction Of Cryptococcus Neofor mans With Murine Macrophages And Dendritic Cells Trends in Emerging Viral Infections of Swine includes sections on global trade, vaccination regimens against new and emerging viruses, epidemiology and control, as well as significant new outbreaks like the West Nile virus. A contributor to Diseases of Swine, 8th edition, Dr. Zimmerman has selected three additional editors with international expertise.

Handbook of In Vivo Chemistry in Mice Dendritic cells are vital to induce potent anti-viral immune responses. It will become clear to the reader that dendritic cells often play a dual role during viral infections. On the one hand they are able to mount potent antiviral immune responses, and on the other hand several viruses, including HIV-1, use DC as a vector to be transferred from the periphery to the lymph nodes where they infect their prime target.

Dendritic Cells and Virus Infection In light of the critical contributions of macrophages and dendritic cells to diverse inflammatory diseases and to immunity and host defense, state-of-the-art approaches to the investigation of their behavior are essential. In Macrophages and Dendritic Cells: Methods and Protocols, expert researchers contribute laboratory protocols involving these two vital cell types functioning at the junction of the innate and acquired immune systems. The volume delves first into isolation and cell culturing then continues with topics such as phagocytosis, genetic manipulation, macrophage activation, and lipid signaling. Written in the highly successful Methods in Molecular Biology™ series format, chapters include brief introductions to their respective subjects, lists of the necessary materials and reagents, step-by-step, readily reproducible protocols, and notes on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Macrophages and Dendritic Cells: Methods and Protocols provides a timely and useful guide for both seasoned investigators and neophytes pursuing this imperative field of study.
Epidermal Langerhans Cells

Tumor Immunology and Immunotherapy - Cellular Methods Part B Immune System Accessory Cells provides a comprehensive survey of all types of antigen-presenting and accessory cells. Macrophages are emphasized through descriptions of different types of endocytosis, other major properties, and all basic and new information concerning macrophages as antigen-presenting cells. Other topics covered include the impact of the immunodeficient state on accessory functions, the evolutionary emergence of accessory functions, and the role of various cell types in defense reactions in major assemblages of Metazoa. The book also presents a chapter describing the phylogenetic aspects of accessory functions, which traces the first accessory cells during the evolution of living matter. Immune System Accessory Cells is an excellent reference for immunologists, cell biologists, and others interested in developing an understanding of the roles of accessory cells in all facets of immune reactions.

The Role of Dendritic Cells and Monocytes in HIV Infection

Fasciola hepatica "Infogest" (Improving Health Properties of Food by Sharing our Knowledge on the Digestive Process) is an EU COST action/network in the domain of Food and Agriculture that will last for 4 years from April 4, 2011. Infogest aims at building an open international network of institutes undertaking multidisciplinary basic research on food digestion gathering scientists from different origins (food scientists, gut physiologists, nutritionists). The network gathers 70 partners from academia, corresponding to a total of 29 countries. The three main scientific goals are: Identify the beneficial food components released in the gut during digestion; Support the effect of beneficial food components on human health; Promote harmonization of currently used digestion models Infogest meetings highlighted the need for a publication that would provide researchers with an insight into the advantages and disadvantages associated with the use of respective in vitro and ex vivo assays to evaluate the effects of foods and food bioactives on health. Such assays are particularly important in situations where a large number of foods/bioactives need to be screened rapidly and in a cost effective manner in order to ultimately identify lead foods/bioactives that can be the subject of in vivo assays. The book is an asset to researchers wishing to study the health benefits of their foods and food bioactives of interest and highlights which in vitro/ex vivo assays are of greatest relevance to their goals, what sort of outputs/data can be generated and, as noted above, highlight the strengths and weaknesses of the various assays. It is also an important resource for undergraduate students in the 'food and health' arena.

Avian Immunology The structure, functions, and interactions of myeloid cells have long been the focus of research and therapeutics development. Yet, much more remains to be discovered about the complex web of relationships that makes up the immune systems of animals. Scientists today are applying genome-wide analyses, single-cell methods, gene editing, and modern imaging techniques to reveal new subclasses of differentiated myeloid cells, new receptors and cytokines, and important interactions among immune cells. In Myeloid Cells in Health and Disease: A Synthesis, Editor Siamon Gordon has assembled an international team of esteemed scientists to provide their perspectives of myeloid cells during innate and adaptive immunity. The book begins by presenting the foundational research of Paul Ehrlich, Elie Metchnikoff, and Donald Metcalf. The following chapters discuss evolution and the life cycles of myeloid cells; specific types of differentiated myeloid cells, including macrophage differentiation; and antigen processing and presentation. The rest of the book is organized by broad topics in immunology, including the recruitment of myeloid and other immune cells following microbial infection; the role of myeloid cells in the inflammation process and the repair of damaged tissue; the vast arsenal of myeloid cell secretory molecules, including metalloproteinases, tumor necrosis factor, histamine, and perforin receptors and downstream signaling pathways that are activated following ligand-receptor binding roles of myeloid cells during microbial and parasite infections; contributions of myeloid cells in atherosclerosis; myeloid-derived suppressor cells in tumor development and cancer; myeloid effects on hematology, microbial pathogenesis, infectious disease, pathology, and pharmacology. Established scientists and physicians in these and related fields will enjoy the book's rich history of myeloid cell research and suggestions for future research directions and potential therapies.

Dendritic Cell and Macrophage Nomenclature and Classification The Janeway’s Immunobiology CD-ROM, Immunobiology Interactive, is included with each book, and can be purchased separately. It contains animations and videos with voiceover narration, as well as the figures from the text for presentation purposes.

Human Monocytes The first textbook of its kind dealing with composite tissue allotransplant and allograft transplantation, provides an excellent overview on the subject. It provides a clear description of the current status of the transplant of every composite tissue allograft already performed and others which are still at the basic experimental level. The editors of the book, who also contribute chapters in their expertise, are world renowned surgeons. This book opens with an introductory chapter on the history of this type of transplantation and then details the clinical experience in each graft such as hand, larynx, face, uterus and the related histopathology, immunosuppression and immunomodulation. A multidisciplinary and comprehensive presentation of the various aspects of this new area of transplantation will allow the reader to understand the complexity and the challenges of composite tissue transplantation. A number of important topics are analyzed and discussed in detail, such as the ethical, medicolegal, psychological and immunological implications. New rehabilitation techniques and strategies, together with innovative tools for the functional evaluation of the transplanted parts, are highlighted. A section on the experimental work underlines what lies ahead of us. 0373 - Time-dependent Changes In Synovial Macrophage And Dendritic Cells In A Murine Model Of Osteoarthritis "The first time I went to the United States was in 1953 to the Cold Spring Harbor symposium where Jim Watson described in detail his model of double helix. All these symposia were extremely important. I think Cold Spring Harbor was one of the birthplaces of molecular biology" - Francois Jacob The Symposium have been one of the great institutions of such research for over 70 years and the history of whole fields can be found in the pages of the Symposia volumes. The 78th Cold Spring Harbor Symposium addresses Immunity & Tolerance. Topics include: Stem
Dendritic Cell Protocols The mononuclear phagocyte system (MPS) comprises dendritic cells (DCs), monocytes and macrophages (MØs) that together play crucial roles in tissue immunity and homeostasis, but also contribute to a broad spectrum of pathologies. They are thus attractive therapeutic targets for immune therapy. However, the distinction between DCs, monocytes and MØ subpopulations has been a matter of controversy and the current nomenclature has been a confounding factor. DCs are remarkably heterogeneous and consist of multiple subsets traditionally defined by various surface markers. While markers are important to define various populations of the MPS, they do not specifically define the intrinsic nature of a cell population and do not always segregate a bona fide cell type of relative homogeneity. Markers are redundant, or simply define distinct activation states within one subset rather than independent subpopulations. One example are the steady-state CD11c+ DCs which are often not distinguished from monocytes, monocyte-derived cells, and macrophages due to their overlapping phenotype. Lastly, monocyte fate determination results in cells not only bearing the markers inherited from their precursors, but also in the context of the study and the focus of the laboratory, a monocyte-derived cell will be either be called "monocyte-derived DCs" or "macrophages". Because the names we give to cells are often associated with a functional connotation, this is much more than simple semantics. The "name" we give to a population fundamentally changes the perception of its biology and can impact on research design and interpretation. Recent evidence in the ontogeny and transcriptional regulation of DCs and MØs, combined with the identification of DC- and MØ-specific markers has dramatically changed our understanding of their interrelationship in the steady state and inflammation. In steady state, DCs are constantly replaced by circulating blood precursors that arise from committed progenitors in the bone marrow. Similarly, some MØ populations are also constantly replaced by circulating blood monocytes. However, others tissue MØs are derived from embryonic precursors, are seeded before birth and maintain themselves in adults by self-renewal. In inflammation, such differentiation pathways are fundamentally changed and unique monocyte-derived inflammatory cells are generated. Current DC, monocyte and MØ nomenclature does not take into account these new developments and as a consequence is quite confusing. We believe that the field is in need of a fresh view on this topic as well as an upfront debate on DC and MØ nomenclature. Our aim is to bring expert junior and senior scientists to revisit this topic in light of these recent developments. This Research Topic will cover all aspects of DC, monocyte and MØ biology including development, transcriptional regulation, functional specializations, in lymphoid and non-lymphoid tissues, and in both human and mouse models. Given the central position of DCs, monocytes and MØs in tissue homeostasis, immunity and disease, this topic should be of interest to a large spectrum of the biomedical community.

Coronavirus Disease 2019 (COVID-19) This volume described basic and advanced protocols to study F. hepatica parasite biology. Chapters guide readers through protocols on different developmental stages of F. hepatica, characterize tegumental, secreted proteins, spatial and temporal gene expression, immunological effects of ESP on macrophages, eosinophil apoptosis, macrophages alternative activation, toll-like receptor interactions, obtain peritoneal and splenic dendritic cells of mice, and protocols to detect F. hepatica abundancelazolamide resistance. 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, Fasciola hepatica: Methods and Protocols provides different topics in areas such a biochemistry, immunology, molecular biology, microscopy, vaccinology in order to extend the interest in this book to research community working with Fasciola hepatica and related trematodes.

Harnessing the Participation of Dendritic Cells in Immunity and Tolerance This extensive volume covers basic and advanced aspects of peptide antibody production, characterization and uses. Although peptide antibodies have been available for many years, they continue to be a field of active research and method development. For example, peptide antibodies which are dependent on specific posttranslational modifications are of great interest, such as phosphorylation, citrullination and others, while different forms of recombinant peptide antibodies are gaining interest, notably nanobodies, single chain antibodies, TCR-like antibodies, among others. Within this volume, those areas are covered, as well as several technical and scientific advances: solid phase peptide synthesis, peptide carrier conjugation and immunization, genomics, transcriptomics, proteomics and elucidation of the molecular basis of antigen presentation and recognition by dendritic cells, macrophages, B cells and T cells. 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. Comprehensive and authoritative, Peptide Antibodies: Methods and Protocols serves as an ideal reference for researchers exploring this vital and expanding area of study.

Cancer Immunotherapy There has been major growth in understanding immune suppression mechanisms and its relationship to cancer progression and therapy. This book highlights emerging new principles of immune suppression that drive cancer and it offers radically new ideas about how therapy can be improved by attacking these principles. Following work that firmly establishes immune escape as an essential trait of cancer, recent studies have now defined specific mechanisms of tumoral immune suppression. It also demonstrates how attacking tumors with molecular targeted therapies or traditional chemotherapeutic drugs can produce potent anti-tumor effects in preclinical models. This book provides basic, translational, and clinical cancer researchers an indispensable overview of immune escape as a critical trait in cancer and how applying specific combinations of immunotherapy and chemotherapy to attack this trait may radically improve the treatment of advanced disease. * Offers a synthesis of concepts that are useful to cancer immunologists and pharmacologists, who tend to work in disparate fields with little cross-communication * Drs Frendegast and Jaffe are internationally recognized leaders in cancer biology and immunology who have created a unique synthesis of fundamental and applied concepts in this important new area of cancer research * Summarizes the latest understanding about how immune escape defines an essential trait of cancer * Includes numerous illustrations including: how molecular-targeted therapeutic drugs or traditional chemotherapy can be combined with immunotherapy to improve anti-tumor efficacy and how
reversing immune suppression by the tumor can cause tumor regression

Host Response to Biomaterials Tumor Immunology and Immunotherapy - Cellular Methods Part B, Volume 632, the latest release in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. Topics covered include Quantitation of calreticulin exposure associated with immunogenic cell death, Side-by-side comparisons of flow cytometry and immunohistochemistry for detection of calreticulin exposure in the course of immunogenic cell death, Quantitative determination of phagocytosis by bone marrow-derived dendritic cells via imaging flow cytometry, Cytofluorometric assessment of dendritic cell-mediated uptake of cancer cell apoptotic bodies, Methods to assess DC-dependent priming of T cell responses by dying cells, and more. Contains content written by authorities in the field Provides a comprehensive view on the topics covered Includes a high level of detail

Alcohol In light of the critical contributions of macrophages and dendritic cells to diverse inflammatory diseases and to immunity and host defense, state-of-the-art approaches to the investigation of their behavior are essential. In Macrophages and Dendritic Cells: Methods and Protocols, expert researchers contribute laboratory protocols involving these two vital cell types functioning at the juncture of the innate and acquired immune systems. The volume delves first into isolation and cell culturing then continues with topics such as phagocytosis, genetic manipulation, macrophage activation, and lipid signaling. Written in the highly successful Methods in Molecular BiologyTM series format, chapters include brief introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible protocols, and notes on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Macrophages and Dendritic Cells: Methods and Protocols provides a timely and useful guide for both seasoned investigators and neophytes pursuing this imperative field of study.

Measuring Immunity The third edition of this volume is aimed at providing both beginners and more experienced researchers a choice of methods to isolate and analyze dendritic cells (DC). An introductory review provides an overview of recent advances in the characterization of DC subsets in mouse and human. While additional chapters provide methods to culture human and mouse dendritic cells, protocols for the isolation of dendritic cells, the isolation of dendritic cell progenitors from mouse, and the purification of dendritic cells from human blood. 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, Dendritic Cell Protocols, Third Edition aims to ensure successful results in the further study of this vital field.

Dendritic Cells in Cancer 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.

New Advances and Contributions to Fish Biology This detailed book showcases the tremendous effort and progress made in developing techniques and protocols for the study of immunometabolism, and in utilizing recent technological advances for probing and manipulating adipose and immune cells, and subsequently, their functions and immunometabolic consequences. Written by experts in the field, many chapters use macrophages as a model immune cell type, due to their prominence in the innate immune system and the exhaustive study of their traits. Protocols using adipocytes, dendritic cells, and T cells as model cell lines, as well as measurement of glucose metabolism at the systemic level, have also been included. Written for the highly successful Methods in Molecular Biology book series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Immunometabolism: Methods and Protocols serves as a vital guide for researchers working at the important interface of immunology and metabolism.

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