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Current Topics in Microbiology and ImmunologyImmunity to Malaria and Vaccine StrategiesViruses, Pandemics, and ImmunityContemporary Topics in Molecular ImmunologyImmunity to Parasitic InfectionImmunology for Pharmacy - E-BookCurrent Topics in Microbiology and ImmunologyCurrent Topics in Microbiology and Immunology / Ergebnisse der Mikrobiologie und Immunit ä tsforschungTertiary Lymphoid StructuresImmunology of SiliconesImmunology of SiliconesCurrent Protocols in ImmunologyImmune system modeling and analysisContemporary Topics in Molecular ImmunologyImmunological SynapseContemporary Topics in Molecular ImmunologyTranslational ImmunologyThe Ageing Immune System and HealthShaping of Human Immune System and Metabolic Processes by Viruses and MicroorganismsMycoplasma pneumoniae Clinical Manifestations, Microbiology, and ImmunologyAmphioxus ImmunityCurrent Topics in Microbiology and Immunology / Ergebnisse der Mikrobiologie und Immunit ä tsforschungWild Immunology–The Answers Are Out ThereMalaria ImmunologyReproductive ImmunologyCanine Parasites and Parasitic DiseasesOncoimmunologyCurrent Topics in Diabetes ResearchAdvances in ImmunologyOn ImmunityRadiation and the Immune System: Current Knowledge and Future PerspectivesThe Immune ResponseThe Past and the Future of Human Immunity Under Viral Evolutionary PressurePsychoneuroimmunologyStructural ImmunologyInsect ImmunologyStress and ImmunityCurrent Topics in Microbiology and ImmunologyCurrent Topics in Microbiology and ImmunologyFlow Cytometry and Cell Sorting

[Current Topics in Microbiology and Immunology](#)

[Immunity to Malaria and Vaccine Strategies](#)

The present book intends to provide an update on immunosenescence and how deficiencies in the immune system contribute to a higher susceptibility to infections, decline in organ function, reduced vaccination responses, age-related disease and the ageing process itself, negatively affecting longevity. Our focus is on the main changes in immune system cells and their products occurring during the ageing process and the possible consequences for health and disease. This includes: discussion of the modulatory and/or suppressive mechanisms associated with the alterations in T regulatory cells, B regulatory cells and Myeloid Derived Suppressor cells; changes in the immune system observed in chronic neurodegenerative diseases, cancer,

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lung disease and frailty will also be discussed. Most importantly we provide recent literature information about possible interventions (focusing on physical activity) that could alleviate the negative effects of immunosenescence. The Ageing Immune System and Health is a comprehensive guide on the field intended to all physicians, researchers, professors and students interested on relationship between immune system, ageing and health.

[Viruses, Pandemics, and Immunity](#)

Despite extensive efforts to control it, malaria is still one of the most devastating infectious diseases worldwide. This book, now in its second edition, provides a broad and up-to-date overview of the rapidly expanding field of malaria immunology and its importance in the control of this disease. The first section deals with the malaria parasite and its interactions with both the vertebrate host and the mosquitoes which transmit the disease. In the second part, the mechanisms of immunity and their regulation by environmental and genetic factors are discussed. Finally, this volume contains several chapters on malaria vaccine development, describing the application of the most recent vaccine technologies as well as ongoing and planned vaccine trials. Authored by well-recognized experts, this volume not only demonstrates the rapid progress being made in the search for vaccines against malaria, but also broadens our understanding of immunity to infection in general. It is therefore highly recommended reading for all scientists and professionals in the fields of immunology, infection and vaccine development.

[Contemporary Topics in Molecular Immunology](#)

A New York Times Best Seller A National Book Critics Circle Award Finalist A New York Times Book Review Top 10 Book of the Year A Facebook "Year of Books" Selection One of the Best Books of the Year * National Book Critics Circle Award finalist * The New York Times Book Review (Top 10) * Entertainment Weekly (Top 10) * New York Magazine (Top 10)* Chicago Tribune (Top 10) * Publishers Weekly (Top 10) * Time Out New York (Top 10) * Los Angeles Times * Kirkus * Booklist * NPR's Science Friday * Newsday * Slate * Refinery 29 * And many more Why do we fear vaccines? A provocative examination by Eula Biss, the author of Notes from No Man's Land, winner of the National Book Critics Circle Award Upon becoming a new mother, Eula Biss addresses a chronic condition of fear-fear of the government, the medical establishment, and what is in your child's air, food, mattress, medicine, and vaccines. She finds that you cannot immunize your child, or yourself, from the world. In this bold, fascinating book, Biss investigates the metaphors and myths surrounding our conception of immunity and its

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implications for the individual and the social body. As she hears more and more fears about vaccines, Biss researches what they mean for her own child, her immediate community, America, and the world, both historically and in the present moment. She extends a conversation with other mothers to meditations on Voltaire's *Candide*, Bram Stoker's *Dracula*, Rachel Carson's *Silent Spring*, Susan Sontag's *AIDS and Its Metaphors*, and beyond. *On Immunity* is a moving account of how we are all interconnected—our bodies and our fates.

[Immunity to Parasitic Infection](#)

Recent advances in the understanding of microbiota in health and diseases are presented in this special issue of *Frontiers in Immunology* and *Frontiers in Microbiology* as well as their impact on the immune system that can lead to the development of pathologies. Potential perspectives and biomarkers are also addressed. We offer this Research Topic involving 64 articles and 501 authors to discuss recent advances regarding: 1. An overview of the human microbiota and its capacity to interact with the human immune system and metabolic processes, 2. New developments in understanding the immune system's strategies to respond to infections and escape strategies used by pathogens to counteract such responses, 3. The link between the microbiota and pathology in terms of autoimmunity, allergy, cancers and other diseases.

[Immunology for Pharmacy - E-Book](#)

[Current Topics in Microbiology and Immunology](#)

This issue of *Current Topics in Microbiology and Immunology* records the proceedings of a Workshop on the Immunology of Silica held at the Natcher Conference Center, National Institutes of Health, Bethesda, Maryland, March 13 and 14, 1995. A large number of investigators from North America and Europe met to discuss available data on how the immune system responds to silicas and related materials. Some aspects of this field are controversial. Nonetheless, the meeting was marked by a civil and open exchange of scientific information and divergent interpretations, reflecting the traditions of scientific communication. Each invited participant was asked to submit an article summarizing his/her presentation. Most of the papers are published as submitted, with only editorial changes to conform with the guidelines given to each contributor or revisions to clarify aspects of the paper. The papers should not be regarded as peer-reviewed publications. This preface will

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attempt to outline some of the immunological areas of investigation relating to silicones.

[Current Topics in Microbiology and Immunology / Ergebnisse der Microbiologie und Immunitätsforschung](#)

The Immune Response is a unique reference work covering the basic and clinical principles of immunology in a modern and comprehensive fashion. Written in an engaging conversational style, the book conveys the broad scope and fascinating appeal of immunology. The book is beautifully illustrated with superb figures as well as many full color plates. This extraordinary work will be an invaluable resource for lecturers and graduate students in immunology, as well as a vital reference for research scientists and clinicians studying related areas in the life and medical sciences. Current and thorough 30 chapter reference reviewed by luminaries in the field Unique 'single voice' ensures consistency of definitions and concepts Comprehensive and elegant illustrations bring key concepts to life Provides historical context to allow fuller understanding of key issues Introductory chapters 1-4 serve as an 'Immunology Primer' before topics are discussed in more detail

[Tertiary Lymphoid Structures](#)

New information is developing so rapidly in the entire field of immunology that one is unable to remain abreast of all advancing fronts. In many cases, considerable information has accumulated as the result of the efforts of many investigators, but the conclusions from the various laboratories have not been summarized recently in a comprehensible manner. One such situation has to do with work on IgD. An up-to-date report on this immunoglobulin was included in Volume 10f this series, but since that time there has been considerable progress in the determination of its structure and function. In the present volume Leslie and Martin have reviewed the accomplishments of recent years and the problems remaining to be solved. New information regarding the concentration of IgD in body fluids in normal and disease states is presented. Studies of the ontogeny of surface IgD in animals are described, and the findings imply that it may be important in the primary immune response. The role of IgD on lymphocyte surfaces is thoroughly discussed especially in terms of stimulating or suppressive combinations of signals delivered to the lymphocyte by agents which bind or alter the surface receptors. The authors conclude by proposing a model for plasma-cell differentiation which accounts for the existence of triple Ig-bearing cells, many IgM-IgD-bearing cells, and the low percentage of cells bearing a single isotype. Sometimes the serum of an individual contains abnormally large amounts of two distinct, homogeneous populations of immunoglobulins.

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[Immunology of Silicones](#)

In this book, leading experts in cancer immunotherapy join forces to provide a comprehensive guide that sets out the main principles of oncoimmunology and examines the latest advances and their implications for clinical practice, focusing in particular on drugs with FDA/EMA approvals and breakthrough status. The aim is to deliver a landmark educational tool that will serve as the definitive reference for MD and PhD students while also meeting the needs of established researchers and healthcare professionals. Immunotherapy-based approaches are now inducing long-lasting clinical responses across multiple histological types of neoplasia, in previously difficult-to-treat metastatic cancers. The future challenges for oncologists are to understand and exploit the cellular and molecular components of complex immune networks, to optimize combinatorial regimens, to avoid immune-related side effects, and to plan immunomonitoring studies for biomarker discovery. The editors hope that this book will guide future and established health professionals toward the effective application of cancer immunology and immunotherapy and contribute significantly to further progress in the field.

[Immunology of Silicones](#)

With a new pharmacy-specific approach to immunology, Immunology for Pharmacy prepares pharmacists for practice by providing a complete understanding of the basis of immunology and the consequences of either suppressing or enhancing immune function. It covers key subjects such as prophylaxis and vaccination, antibodies as therapeutic and diagnostic agents, biological modifiers, and the rationale for use and mechanisms of therapeutic agents. Written by experienced author and educator Dennis Flaherty, this book presents topics with a logical, step-by-step approach, explaining concepts and their practical application. A companion Evolve website reinforces your understanding with flashcards and animations. Pharmacy-specific coverage narrows the broad field of immunology to those areas most pertinent and clinically relevant to pharmacy students. 165 full-color illustrations help to illuminate difficult concepts. Factors That Influence the Immune Response chapter covers biological agents including bacteria, viruses, and fungi, and their related toxins and how they relate to the immune system. Three chapters on vaccinations prepare you for this important part of the pharmacist's role by discussing cancer treatment with whole tumor vaccines, cell vaccines, and viral vector vaccines, describing other vaccines such as recombinant vaccines and plant vaccines, and examining how diseases such as diphtheria, whooping cough, and tetanus respond to vaccinations. A summary of drugs used in treating each condition helps you understand typical treatments and their immunological mechanisms, so you can choose proper treatments. Integrated information makes it easier to understand how

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various parts of the immune system work together, leading to a better understanding of immunology as a whole. A unique focus on practical application and critical thinking shows the interrelationship of concepts and makes it easier to apply theory to practice. Information on AIDS covers the identification and treatment of both strains of HIV as well as AIDS, preparing you for diseases you will see in practice. Unique student-friendly features simplify your study with learning objectives and key terms at the beginning of each chapter, bulleted summaries and self-assessment questions at the end of each chapter, and a glossary at the back of the book. Over 60 tables summarize and provide quick reference to important material. A companion Evolve website includes animations and pharmacy terminology flashcards.

[Current Protocols in Immunology](#)

There is a long-standing evolutionary battle between viruses and their hosts that continues to be waged. The evidence of this conflict can be found on both sides, with the human immune system being responsive to new viral challenges and viruses having developed often sophisticated countermeasures. The “arms race” between viruses and hosts can be thought as an example of the “Red Queen” race, an evolutionary hypothesis inspired from the dialogue of Alice with the Red Queen in Lewis Carroll’s “Through the Looking-Glass”. At the same time, viruses have a minimal genomic content as they have evolved to hitchhike biological machinery of their hosts (or other co-infecting viruses). The minimalistic viral genome could be thought as the result of a “Black Queen” evolution, a theory inspired from the card game Heart, where the winner is the one with the fewest points at the end. The effects of this arms race are evident in the evolution of the human immune system. This system is capable of responding to diverse viral challenges, utilizing both the ancient innate immune system and the more recently evolved adaptive immune system of jawed vertebrates. It is now well-known that the two systems are linked, with innate immunity hypothesized to have provided raw material for the emergence of the adaptive immune response. The adaptive immune response comprises several protein families (including B and T cell receptors, MHC and KIR proteins, for example) that are encoded by complex and variable genomic regions. This complexity enables for responsive genetic changes to occur in immune cells, such as the ability of genomic hypervariable regions in B cells to recombine in order to produce more specific antibodies. Indeed, the human immune system is thought to be continually evolving via various mechanisms such as changes in the genes encoding immune receptors and the regulatory sequences that control their expression. For example, there is some evidence that exogenous viral infections can alter the expression of endogenous retroviruses, some of which contribute to the immune response. Viral countermeasures can include encoding decoy receptors for the signalling molecules of the immune response, altering the gene expression of adaptive immune cells during chronic infection or using host enzymes to

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facilitate viral immune escape. As the articles herein show, the immune system continues to be challenged by viral infections and these challenges continue to shape how the immune system combats pathogens, thus viruses and human immunity are continuously part of “Red and Black Queen” evolutionary dynamics. We had the pleasure of working with Jonas Blomberg as a reviewer during the course of the Research Topic and his untimely passing was a great loss. Prof. Blomberg made significant contributions, including to the nomenclature of endogenous retroviruses (ERVs), the evolution and characterization of specific human ERV (HERV) and the contribution of ERVs to diseases such as cancer. It is with great respect for his contributions to the ERV field that we dedicate this eBook to his memory.

[Immune system modeling and analysis](#)

Psychoneuroimmunology, Second Edition presents reports on the relationship between the nervous and immune systems. The book is divided into four sections. The first section details the role of neural structures and neurotransmitter signals in communication with the immune system. It documents the extensive neural connections with organs of the immune system; the dynamics of noradrenergic sympathetic innervation of spleen and thymus; and the evidence for immune signaling of the CNS. Part II elaborates the role of hormones in the modulation of immune functions; the basis for bidirectional communication between the neuroendocrine and immune systems; and the potential physiological implications of these neuroendocrine-immune system interactions. The third part addresses behavioral influences on immune response; the effects of conditioning, stress and social interactions in modulating immune responses; and the behavioral consequences of experimentally altered or genetically determined immunologic states. The final section presents the effects of psychosocial factors on immune responses and the potential impact of behavioral interventions in modulating immunity in healthy human subjects and in patients with AIDS. Neuroscientists, endocrinologists, and immunologists will find the book interesting.

[Contemporary Topics in Molecular Immunology](#)

Features up-to-date reviews of the most advanced clinical methods currently being used to evaluate the metabolic and biological alterations accompanying diabetic disease. Additionally, the volume analyzes the complex plurimetabolic syndrome, commonly known as syndrome X.

[Immunological Synapse](#)

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"Informed and accessible overview of viruses and pandemics, how our immune system combats them, and how diagnostic tests, vaccines, and antiviral therapies work to form the foundation of public health"--

[Contemporary Topics in Molecular Immunology](#)

The "Stress and Immunity" Research Topic includes two distant and seemingly unrelated forms of stress: physicochemical stress and psychological stress. In both forms of stress the body adapts to the changes in the environment. The different chapters of this eBook deal with aspects relevant for the fascinating interplay of various distinct stressors with the immune system.

[Translational Immunology](#)

This issue of Current Topics in Microbiology and Immunology records the proceedings of a Workshop on the Immunology of Silicosis held at the Natcher Conference Center, National Institutes of Health, Bethesda, Maryland, March 13 and 14, 1995. A large number of investigators from North America and Europe met to discuss available data on how the immune system responds to silicones and related materials. Some aspects of this field are controversial. Nonetheless, the meeting was marked by a civil and open exchange of scientific information and divergent interpretations, reflecting the traditions of scientific communication. Each invited participant was asked to submit an article summarizing his/her presentation. Most of the papers are published as submitted, with only editorial changes to conform with the guide lines given to each contributor or revisions to clarify aspects of the paper. The papers should not be regarded as peer-reviewed publications. This preface will attempt to outline some of the immunological areas of investigation relating to silicones.

[The Ageing Immune System and Health](#)

Immunochemistry, recently rechristened molecular immunology, has been preoccupied throughout its long history with the structure and function of antibodies and the specificity of antibody-antigen reactions. With the recent X-ray diffraction of several crystallized immunoglobulin (Ig) fragments and a whole molecule analysis of an Ig molecule, the three-dimensional structure of antibodies and their ligand combining sites has been realized, marking the concluding stages of a phase of immunological

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research that can be traced back at least 75 years. At the same time chemically minded immunologists have been moving in new directions. A substantial beginning in one direction has been made with the purification of messenger RNAs (mRNAs) for Ig chains. Hybridization of these RNAs (or their DNA copies made with the enzyme reverse transcriptase) to cell DNA is beginning to provide convincing estimates of the number of germ-line Ig genes. And some hybridization studies have already yielded suggestive evidence for translocation of V and C genes from separate to contiguous positions in DNA isolated from cells at different stages of differentiation. Moreover, in vitro translation of Ig mRNAs has revealed a remarkably hydrophobic stretch of about 20 amino acids at the N-terminus of the nascent Ig chain. This extra piece is absent in the Ig extracted from or secreted by plasma cells, presumably because it is rapidly cleaved from the "preimmunoglobulin" chain within the cell, but the extra piece probably plays a key role in directing the synthesis of preIg to the cell's secretory pathway.

[Shaping of Human Immune System and Metabolic Processes by Viruses and Microorganisms](#)

This book presents a comprehensive overview of important immune molecules and their structure-function relationships. The immune system is highly complex, consisting of a network of molecules, cells, tissues and organs, and the immune reaction is involved in various physiological as well as pathological processes, including development, self-tolerance, infection, immunity, and cancer. Numerous molecules participate in immune recognition, inhibition and activation, and these important immune molecules can be roughly divided into cell surface receptors, intracellular receptors and intracellular signaling molecules. The study of how these immune molecules function at molecular level has laid the foundation for understanding the immune system. The book provides researchers and students with the latest research advances concerning the structural biology of key immune molecules/pathways, and offers immunologists essential insights into how these immune molecules function.

[Mycoplasma pneumoniae Clinical Manifestations, Microbiology, and Immunology](#)

Several discoveries are noteworthy for allowing us to probe the recesses of the virus infected cell and to search for cryptic viral genomes which might provide clues in our studies of cancer etiology or developmental biology. One of the most notable was the discovery of reverse transcriptase. This marked a momentous occasion in the history of molecular biology. Not only did it provide insight into the mechanism of persistence of retroviruses but it also provided us with an enzyme that could synthesize a DNA copy of any RNA. This DNA copy could then be used as a hybridization reagent to search for both complementary DNA and viral-specific RNA. Thus one could follow the course of any viral infection or probe in tumor cells for hidden viral genomes.

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Second, a great deal of credit must be given to the geneticists who isolated the various deletion mutants in the 'avian retrovirus system and thus provided us with the first means of isolating gene-specific probes. Finally, the laboratories which have mapped the genome have provided us with the framework in which to ask very specific questions with our gene-specific probes. Recently, numerous excellent reviews concerning various aspects of the retroviruses have appeared. In this review I shall not even attempt to present a comprehensive review of retroviruses.

[Amphioxus Immunity](#)

Translational Immunology: Mechanisms and Pharmacologic Approaches highlights and summarizes the most important advances in human immunology, clinical translations, new tools to analyze therapeutic targets, and new pharmacological approaches for autoimmunity, inflammatory disorders, and cancer. The book is an essential resource for those seeking to understand the potential translational applications of burgeoning studies in human immunology, helping readers make sense of the existing and emerging scientific advances. The book grounds fundamental science in the translational realm, providing insights from world renowned researchers at the top of their game in their respective fields, in both industry and academic settings. Readers will gain an understanding of the rationale and mechanisms underlying current and emerging pharmacologic approaches for interventional immunology, the gaps therein, and new ideas for better and safer therapeutic approaches, and physicians will glean information about pharmacological limitations in altering disease progression and complications. This reference on the translational realization of the burgeoning findings in immunology provides a go-to reference for experienced professional clinicians, researchers, industry scientists, and those seeking more information on the field. Delivers comprehensive coverage of seminal human immunology discoveries and the resulting impact on therapeutic strategies Presents potential novel targets and approaches for clinical applications in organ specific and systemic autoimmunity, transplant rejection, cancer, and vaccine development Discusses lessons learned from successful and failed clinical trials with specific interventions, including pharmacological issues and limitations, and complications due to immunosuppression Provides information on new strategies and outstanding issues that should be addressed in future research

[Current Topics in Microbiology and Immunology / Ergebnisse der Mikrobiologie und Immunitätsforschung](#)

Current Protocols in Immunology is a three-volume looseleaf manual that provides comprehensive coverage of immunological

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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.

[Wild Immunology—The Answers Are Out There](#)

This volume explores the various methods used to study tertiary lymphoid structures (TLS) in pathological situations. Pre-clinical models are also discussed in detail to show how TLS structure, development, and maintenance can be targeted and studied in vivo. The chapters in this book cover topics such as humans and mice; strategies to quantify TLS in order to use it in stained tissue sections; classifying a gene signature from fixed and paraffin-embedded tissues; and development of murine inflammatory models to help look at TLS in the context of infection or malignancy. 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 thorough, Tertiary Lymphoid Structures: Methods and Protocols is a valuable resource that increases the reader's knowledge on immune functions and how they will pave the way to future therapeutic applications.

[Malaria Immunology](#)

The proper physiological functioning of most eukaryotic cells requires their assembly into multi-cellular tissues that form organized organ systems. Cells of the immune system develop in bone marrow and lymphoid organs, but as the cells mature they leave these organs and circulate as single cells. Antigen receptors (TCRs) of T cells search for membrane MHC proteins that are bound to peptides derived from infectious pathogens or cellular transformations. The detection of such specific peptide-MHC antigens initiates T cell activation, adhesion, and immune-effectors functions. Studies of normal and transformed

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T cell lines and of T cells from transgenic mice led to comprehensive understanding of the molecular basis of antigen-receptor recognition and signaling. In spite of these remarkable genetic and biochemical advances, other key physiological mechanisms that participate in sensing and decoding the immune context to induce the appropriate cellular immune responses remain unresolved. TCR recognition is tightly regulated to trigger sensitive but balanced T cell responses that result in the effective elimination of the pathogens while minimizing collateral damage to the host. The sensitivity of TCR recognition has to be properly tempered to prevent unintended activation by self-peptide-MHC complexes that cause autoimmune diseases. It is likely that once the TCR is engaged by a peptide-MHC and TCR signaling begins, additional regulatory mechanisms, involving other receptors, would increase the fidelity of the response.

[Reproductive Immunology](#)

Canine Parasites and Parasitic Diseases offers a concise summary, including the distribution, epidemiology, lifecycle, morphology, clinical manifestations, diagnosis, prophylaxis and therapeutic measures on the most important parasites affecting dogs. The book includes their classification, structure, lifecycles, occurrence, and the diagnosis and treatment of infestations. Chapters are presented in a consistent and logical format with extensive use of tables, photographs and line drawings that help veterinarians and students quickly find answers to questions. The book informs on 100 different species of parasite related to the canine world and is aimed not only at veterinary practitioners but also in dog enthusiasts, pharmacies and laboratories. Fully illustrated with high-quality figures and illustrations Provides insights on the risk factors and prevention of parasite infections in dogs and gives guidelines for anthelmintic treatment Serves professionals, students, parasitologists and veterinary scientists Present an easy-to-use handbook on the identification of canine parasites and the diseases associated with parasitic infection

[Canine Parasites and Parasitic Diseases](#)

The rapid development of new methods for immunological data collection - from multicolor flow cytometry, through single-cell imaging, to deep sequencing - presents us now, for the first time, with the ability to analyze and compare large amounts of immunological data in health, aging and disease. The exponential growth of these datasets, however, challenges the theoretical immunology community to develop methods for data organization and analysis. Furthermore, the need to test hypotheses regarding immune function, and generate predictions regarding the outcomes of medical interventions,

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necessitates the development of mathematical and computational models covering processes on multiple scales, from the genetic and molecular to the cellular and system scales. The last few decades have seen the development of methods for presentation and analysis of clonal repertoires (those of T and B lymphocytes) and phenotypic (surface-marker based) repertoires of all lymphocyte types, and for modeling the intricate network of molecular and cellular interactions within the immune systems. This e-Book, which has first appeared as a 'Frontiers in Immunology' research topic, provides a comprehensive, online, open access snapshot of the current state of the art on immune system modeling and analysis.

[Oncoimmunology](#)

Reproductive Immunology: Basic Concepts, Immune Cells and Reproduction provides an introduction to reproductive immunology, focusing on the immunological aspects of specific pregnancy complications. The book includes discussions on immune cells, cytokines and chemokines, along with other topics that are central to the success of a pregnancy, from the process of implantation to parturition. The knowledge on the role of immune cells and the inflammatory process in each step of reproduction has grown exponentially in the last 10 years. Several autoimmune factors have been investigated as possible influences on reproductive success and failure. We are just beginning to understand the complex interactions between the endocrine and immune system that support the human fetal semi-allograft, hence this first volume in the book series gives holistic insights for this understanding. Shows the detailed evaluation of the knowledge related to each immune cell type in the pregnant and not pregnant uterus Evaluates each immune cell type and its function during specific reproductive events Provides the biological background for understanding the clinical aspects that will be discussed in subsequent volumes in the series

[Current Topics in Diabetes Research](#)

Amphioxus Immunity: Tracing the Origin of Human Immunity covers a remarkable range of information about Amphioxus and its evolutionary context. This compilation of what is currently known about Amphioxus, with a sharp focus on its immune system, includes 13 topics, such as: Amphioxus as a model for understanding the evolution of vertebrates basic knowledge of immunology immune organs and cells of amphioxus a genomic and transcriptomic view of the Amphioxus immunity pattern recognition system in Amphioxus transcription factors in Amphioxus the complement system of Amphioxus the oxidative burst system in Amphioxus immune effectors in Amphioxus lipid signaling of immune response in Amphioxus apoptosis in

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amphioxus; primitive adaptive immune system of Amphioxus and future research directions This valuable reference book is loaded with information that will be useful for anyone who wishes to learn more about the origin of vertebrates and adaptive immunity. Provides new evidence on the origin of the adaptive immune system, the evolution of innate immunity, and evolution-stage specific immune defense mechanisms Not only presents the cells and molecules involved in the adaptive immune response in Amphioxus, but also characterizes the origination and evolution of the gene families and pathways involved in innate immunity Includes much pioneering work, from the molecular, genomic, and cellular to the individual level

[Advances in Immunology](#)

Mycoplasma pneumoniae (Mp) is a major human pathogen that causes both upper and lower respiratory infections, and is one of the leading causes of community acquired pneumonia (CAP), accounting for 11-15% of CAP throughout the world. Additionally it is known to induce an inflammatory process which depends on several mechanisms such as virulence of Mp (lipoproteins, community acquired respiratory distress syndrome (CARDS) toxin, oxidative products) and host defenses (cellular immunity and humoral immunity). Although it is a common pathogen, the pathogenesis for Mp infections is not yet fully understood. From the clinical point of view, since the pioneer studies in the 1960s and 1970s on the clinical presentation of Mp associated disease, the diagnostics approaches have changed dramatically leading to a better understanding of the clinical presentation and new issues have emerged - such as antibiotics resistance. The purpose of this Frontiers ebook is to thoroughly review and discuss the clinical presentation in view of the improved diagnostics, microbiological and immunological analysis of Mp infections, with focus on the history of Mp, clinical features of disease, bacterial structure of Mp and mechanism of gliding, clinical and laboratory diagnostics, the role of lipoproteins and Toll-like receptor, CARDS toxin, subtyping of Mp isolates and genome analysis, macrolide resistance and treatment.

[On Immunity](#)

“Go into partnership with nature; she does more than half the work and asks none of the fee.” - Martin H. Fisher. Nature has undertaken an immense amount of work throughout evolution. The evolutionary process has provided a power of information that can address key questions such as - Which immune molecules and pathways are conserved across species? Which molecules and pathways are exploited by pathogens to cause disease? What methods can be broadly used or readily adapted for wild immunology? How does co-infection and exposure to a dynamic environment affect immunity? Section 1 addresses

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these questions through an evolutionary approach. Laboratory mice have been instrumental in dissecting the nuances of the immune system. The first paper investigates the immunology of wild mice and reviews how evolution and ecology sculpt differences in the immune responses of wild mice and laboratory mice. A better understanding of wild immunology is required and sets the scene for the subsequent papers. Although nature doesn't ask for a fee, it is appropriate that nature is repaid in one form or another. The translational theme of the second section incorporates papers that translate wild immunology back to nature. But any non-human, non-laboratory mouse research environment is hindered by a lack of research tools, hence the underlying theme throughout the second section. Physiological resource allocation is carefully balanced according to the most important needs of the body. Tissue homeostasis can involve trade-offs between energy requirements of the host and compensatory mechanisms to respond to infection. The third section comprises a collection of papers that employ novel strategies to understand how the immune system is compensated under challenging physiological situations. Technology has provided substantial advances in understanding the immune system at cellular and molecular levels. The specificity of these tools (e.g. monoclonal antibodies) often limits the study to a specific species or strain. A consequence of similar genetic sequences or cross-reactivity is that the technology can be adapted to wild species. Section 4 provides two examples of probing wild immunology by adapting technology developed for laboratory species.

[Radiation and the Immune System: Current Knowledge and Future Perspectives](#)

[The Immune Response](#)

[The Past and the Future of Human Immunity Under Viral Evolutionary Pressure](#)

This work is the first book-length publication on the topic of insect immunology since 1991, complementing earlier works by offering a fresh perspective on current research. Interactions of host immune systems with both parasites and pathogens are presented in detail, as well as the genomics and proteomics, approaches which have been lacking in other publications. Beckage provides comprehensive coverage of topics important to medical researchers, including *Drosophila* as a model for studying cellular and humoral immune mechanisms, biochemical mediators of immunity, and insect blood cells and their functions. Encompasses the most important topics of insect immunology including mechanisms, genes, proteins, evolution and

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phylogeny Provides comprehensive coverage of topics important to medical researchers including *Drosophila* as a model for studying cellular and humoral immune mechanisms, biochemical mediators of immunity, and insect blood cells and their functions Most up-to-date information published with contributions from international leaders in the field

[Psychoneuroimmunology](#)

Prominent progress in molecular biology was only made when it became possible to separate functionally distinct molecules by taking advantage of their biophysical properties. Likewise, the analysis of the functions of heterogeneous populations of immunocompetent cells, as to the functional properties of their various subpopulations, can not be done until these can be isolated in reasonably pure form by selective fractionation. During the last few years significant advances have been made in this field, and cells have been separated according to size, density or charge (MILLER et al. , 1969; SHORTMAN, 1968; ANDERSSON, 1973 c), or by taking advantage of more specific surface markers to allow selective depletion or enrichment of a given subpopulation of cells (WIGZELL and ANDERSSON, 1971). Although separation techniques have been used in a variety of cellular systems, they have been particularly useful in the study of reticuloendothelial cells and primarily in the study of cells participating in the immune responses. Quite extensive reviews have been written which well cover the methods used for separation of cells and the results obtained with the various approaches (WIGZELL and ANDERSSON, 1971; SHORTMAN, 1972). To review this work is becoming a more and more voluminous task. As data rapidly accumulate, we will not try to make such a complete review.

[Structural Immunology](#)

For long, high dose ionizing radiation was considered as a net immune suppressing agent, as shown, among others, by the exquisite radiosensitivity of the lymphoid system to radiation-induced cell killing. However, recent advances in radiobiology and immunology have made this picture more complex. For example, the recognition that radiation-induced bystander effects, share common mediators with various immunological signalling processes, suggests that they are at least partly immune mediated. Another milestone was the finding, in the field of onco-immunology, that local tumor irradiation can modulate the immunogenicity of tumor cells and the anti-tumor immune responsiveness both locally, in the tumor microenvironment, and at systemic level. These observations paved the way for studies exploring optimal combinations of radiotherapy and immunotherapy in order to achieve a synergistic effect to eradicate tumors. However, not all interactions between radiation and

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the immune system are beneficial, as it was recognized that many of radiation-induced late side effects are also of immune and inflammatory nature. Currently perhaps the most studied field of research in radiation biology is focused around the biological effects of low doses, where many of the observed pathophysiological endpoints are due to mechanisms other than direct radiation-induced cell killing and are immune-related. Finally, it must not be forgotten that the interactions between the ionizing radiations and the immune system are bi-directional, and activation of the immune system also influences the outcome of radiation exposure. This Research Topic brings together 23 articles and aims to give an overview of the complex and very often contradictory nature of the interactions between ionizing radiation and the immune system. Due to its increasing penetrance in the population both through medical diagnostic or environmental sources or during cosmic travel low dose ionizing radiation exposure is becoming a major epidemiological concern world-wide. Several of the articles within the Research Topic specifically address potential long-term health consequences and the underlying mechanisms of low dose radiation exposure. A major intention of the Editors was also to draw the attention of the non-radiobiological scientific community on the fact that ionizing radiation is by far more than purely an immune suppressing agent.

[Insect Immunology](#)

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

[Stress and Immunity](#)

Included in this volume is a broad range of topics. Immunology is such a diverse field that many of the subspecialties overlap, and one finds it convenient and necessary to integrate information from several of them. We try to focus on the molecular aspects of immunology as much as is reasonable, but some contributions consist of a blend of molecular and cellular immunology and even immunopathology. This is as it should be, since information at the molecular level often provides an explanation of phenomena observed at other levels. Myelin basic protein holds the interest of immunologists because it is implicated in the induction of the autoimmune disease called experimental allergic encephalomyelitis (EAE). Although much biochemical and immunological information about this protein has been uncovered, it is not understood how such an

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inaccessible self-antigen can serve as the focal point in the central nervous system for myelin basic protein-specific EAE-inducing T cells. Day discusses the problem by first reviewing the sequences of the proteins from several species and the antigenicity of the proteins and peptides derived from them. The reader is then led into a thorough discussion of the immunological relationships that do and do not influence development of the encephalitis. From this discussion, the author promulgates the bystander model as the best overall mechanism to explain why different fragments of the highly conserved protein are needed by various species to give rise to the same type of localized central nervous system disease.

[Current Topics in Microbiology and Immunology](#)

Malaria, caused by infection with protozoan parasites belonging to the genus *Plasmodium*, is a highly prevalent and lethal infectious disease, responsible for 435,000 deaths in 2017. Optimism that malaria was gradually being controlled and eliminated has been tempered by recent evidence that malaria control measures are beginning to stall and that *Plasmodium* parasites are developing resistance to front-line anti-malarial drugs. An important milestone has been the recent development of a malaria vaccine (Mosquirix) for use in humans, the very first against a parasitic infection. Unfortunately, this vaccine has modest and short-lived efficacy, with vaccinated individuals possibly being at increased risk of severe malarial disease when protection wanes. Thus, to define new ways to combat malaria, there remains an urgent requirement to identify the immune mechanisms that promote resistance to malarial disease and to understand why these so often fail. The review and primary research articles in this Research Topic illustrate the breadth of research performed worldwide aimed to understand the biology of the *Plasmodium* parasite, the roles of the various cell types that act within the immune response against the parasite, and the parasitological and immunological basis of severe malarial disease. The articles in section 1 exemplify the different vaccination strategies being developed and tested by the research community in the fight against malaria. The articles in section 2 review important overarching aspects of malaria immunology and the use of models to study human malaria. The articles in section 3 describe the ways through which the *Plasmodium* parasite is initially recognised by the immune system during infection, how the parasite can directly impact this critical event to restrict anti-Plasmodial immunity, and resolve the roles of key innate cell populations, such as dendritic cells, in coordinating malarial immunity. The articles in sections 4-6 outline the roles T and B cell populations play during malaria, highlighting the activation, diversification and regulation of the crucial cell types during malaria, and discuss some of the reasons adaptive immunity to malaria is often considered so poor compared with other diseases. The articles in section 7 provide up to date information on the pathogenesis of cerebral malaria, bridging our understanding of the syndrome in humans with information learned from animal models. Overall, the articles in

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this research, many of which are published by leaders in the malaria field, emphasize the imagination and technical advances being employed by researchers against malaria. We acknowledge the initiation and support of this Research Topic by the International Union of Immunological Societies (IUIS). We hereby state publicly that the IUIS has had no editorial input in articles included in this Research Topic, thus ensuring that all aspects of this Research Topic are evaluated objectively, unbiased by any specific policy or opinion of the IUIS.

[Current Topics in Microbiology and Immunology](#)

Advances in Immunology, a long-established and highly respected publication, presents current developments as well as comprehensive reviews in immunology. Articles address the wide range of topics that comprise immunology, including molecular and cellular activation mechanisms, phylogeny and molecular evolution, and clinical modalities. Edited and authored by the foremost scientists in the field, each volume provides up-to-date information and directions for the future. Contributions from leading authorities Informs and updates on all the latest developments in the field

[Flow Cytometry and Cell Sorting](#)

Parasitic infections remain a significant cause of morbidity and mortality in the world today. Often endemic in developing countries many parasitic diseases are neglected in terms of research funding and much remains to be understood about parasites and the interactions they have with the immune system. This book examines current knowledge about immune responses to parasitic infections affecting humans, including interactions that occur during co-infections, and how immune responses may be manipulated to develop therapeutic interventions against parasitic infection. For easy reference, the most commonly studied parasites are examined in individual chapters written by investigators at the forefront of their field. An overview of the immune system, as well as introductions to protozoan and helminth parasites, is included to guide background reading. A historical perspective of the field of immunoparasitology acknowledges the contributions of investigators who have been instrumental in developing this field of research.

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