Original Article Angiogenic And Innate Immune Responses

This selection of articles from the Encyclopedia of the Eye provides a comprehensive overview of immunological features, diseases and inflammation of the eye and its support structures and organs. Rather than taking an immunological focus that is strictly suitable for clinicians, the volume offers a considerable basic science background and addresses a broad range of topics - the immune system of the eye, its various disorders, mechanisms of inflammation of the eye and visual system, treatment, wound healing mechanisms, stem cells, and more. The first single volume to integrate comparative studies into a comprehensive resource on the neuroscience of ocular immunology Chapters are carefully selected from the Encyclopedia of the Eye by the world's leading vision researchers The best researchers in the field provide their conclusions in the context of the latest experimental results
Periodontitis - A Useful Reference is a comprehensive book compiled by a team of experts with the objective of providing an overview of the basic pathology of "periodontitis" and its implication on oral health and general systemic health. Periodontitis has become a global health burden in recent days. It is noteworthy that oral health is being considered as the mirror of general health and the study of oral-systemic health connections has advanced among scientists, clinicians, and the public as well. We wish the array of chapters that

highlights the importance and impact of periodontal health could be a useful guide for the community of public, students, and clinicians.

The Mononuclear Phagocyte System (MPS) of vertebrates is composed of monocytes, macrophages and dendritic cells. Together, they form part of the first line of immune defense against a variety of pathogens (bacteria, fungi, parasites and viruses), and thus play an important role in maintaining organism homeostasis. The mode of transmission, type of replication and mechanism of disease-causing differ significantly for each pathogen, eliciting a unique immune response in the host. Within this context, the MPS acts as both the sentinel and tailor of the immune system. As sentinels, MPS cells are found in blood and within tissues throughout the body to patrol against pathogenic insult. The strategy to detect 'microbial non-self' relies on MPS to recognize conserved microbial products known as 'pathogen-associated molecular pattern' (PAMPs). PAMPs recognition represents a checkpoint in the response to pathogens and relies on conserved 'pattern recognition receptors' (PRRs). Upon PRR engagement, MPS mount a cell-autonomous attack that includes the internalization and compartmentalization of intracellular pathogens into toxic compartments that promote destruction. In parallel, MPS cells launch an inflammatory response composed of a cellular arm and soluble factors to control extracellular pathogens. In cases when innate immunity fails to eliminate the invading microbe, MPS serves as a tailor to generate adaptive immunity for pathogen eradication and generation of "memory" cells, thus

ensuring enhanced protection against re-infection. Indeed, MPS cell functions comprise the capture, process, migration and delivery of antigenic information to lymphoid organs, where type-1 immunity is tailored against intracellular microbes and type-2 immunity against extracellular pathogens. However, this potent adaptive immunity is also a double-edge sword that can cause aberrant inflammatory disorders, like autoimmunity or chronic inflammation. For this reason, MPS also tailors tolerance immunity against unwanted inflammation. Successful clearance of the microbe results in its destruction and proper collection of debris, resolution of inflammation and tissue healing for which MPS is essential. Reciprocally, as part of the evolutionary process taking place in all organisms, microbes evolved strategies to circumvent the actions bestowed by MPS cells. Multiple pathogens modulate the differentiation, maturation and activation programs of the MPS, as an efficient strategy to avoid a dedicated immune response. Among the most common evasion strategies are the subversion of phagocytosis, inhibition of PRR-mediated immunity, resistance to intracellular killing by reactive oxygen and nitrogen species, restriction of phagosome maturation, modulation of cellular metabolism and nutrient acquisition, regulation of cell death and autophagy, and modulation of pro-inflammatory responses and hijacking of tolerance mechanisms, among others. The tenet of this eBook is that a better understanding of MPS in infection will yield insights for development of therapeutics to enhance antimicrobial processes or dampen detrimental

inflammation for the host's benefit. We believe that contributions to this topic will serve as a platform for discussion and debate about relevant issues and themes in this field. Our aim is to bring expert junior and senior scientists to address recent progress, highlight critical knowledge gaps, foment scientific exchange, and establish conceptual frameworks for future MPS investigation in the context of infectious disease.

Rev. ed. of: Acute and chronic wounds / [edited by] Ruth A. Bryant, Denise P. Nix. 3rd ed. c2007.

The formation of blood vessels is an essential aspect of embryogenesis in vertebrates. It is a central feature of numerous post-embryonic processes, including tissue and organ growth and regeneration. It is also part of the pathology of tumour formation and certain inflammatory conditions. In recent years, comprehension of the molecular genetics of blood vessel formation has progressed enormously and studies in vertebrate model systems, especially the mouse and the zebrafish, have identified a common set of molecules and processes that are conserved throughout vertebrate embryogenesis while, in addition, highlighting aspects that may differ between different animal groups. The discovery in the past decade of the crucial role of new blood vessel formation for the development of cancers has generated great interest in angiogenesis (the formation of new blood vessels from pre-existing ones), with its major implications for potential cancer-control strategies. In addition, there are numerous situations where therapeutic treatments either require or would be assisted by vasculogenesis (the de novo formation of

blood vessels). In particular, post-stroke therapies could include treatments that stimulate neovascularization of the affected tissues. The development of such treatments, however, requires thoroughly understanding the developmental properties of endothelial cells and the basic biology of blood vessel formation. While there are many books on angiogenesis, this unique book focuses on exactly this basic biology and explores blood vessel formation in connection with tissue development in a range of animal models. It includes detailed discussions of relevant cell biology, genetics and embryogenesis of blood vessel formation and presents insights into the cross-talk between developing blood vessels and other tissues. With contributions from vascular biologists, cell biologists and developmental biologists, a comprehensive and highly interdisciplinary volume is the outcome.

Pancreatic ribonuclease, the focus of highly productive scientific research for more than half a century and the only enzyme to be the basis of four Nobel prizes, has recently undergone a resurgence in popularity for the recognition of an extended ribonuclease superfamily with functions ranging from tumour growth and inhibition to self-recognition and neurotoxicity. This volume highlights the functional diversity of ribonucleases and reveals the emerging research opportunities provided by these enzymes. * Never before has discussion of the entire family of ribonucleases and related enzymes been covered in a single volume * Core chapters focus on the latest structures and functions of pancreatic-type ribonucleases * Structures and functions of intracellular

ribonucleases and nondigestive members of the family are also covered * How ribonucleases continue to serve as excellent systems with which to uncover the secrets of protein chemistry is demonstrated

Tumor angiogenesis is one of the most prominent mechanisms driving tumor development and progression. This book is written by internationally renowned experts. Part 1 describes the basic mechanisms. Tumor-angiogenic signaling pathways are presented as new potential targets for anti-angiogenic therapy. Part 2 reviews the efforts made to validate new targets and to show efficacy in animals. Part 3 is devoted to the clinical development of the novel anti-angiogenic drugs and their use in clinical practice.

This comprehensive text provides a detailed overview of the molecular mechanisms underpinning the development of cancer and its treatment. Written by an international panel of researchers, specialists and practitioners in the field, the text discusses all aspects of cancer biology from the causes, development and diagnosis through to the treatment of cancer. Written by an international panel of researchers, specialists and practitioners in the field Covers both traditional areas of study and areas of controversy and emerging importance, highlighting future directions for research Features up-to-date coverage of recent studies and discoveries, as well as a solid grounding in the key concepts in the field Each chapter includes key points, chapter summaries, text boxes, and topical references for added comprehension and review Supported by a dedicated website at

www.blackwellpublishing.com/pelengaris An excellent text for upper-level courses in the biology of cancer, for medical students and qualified practitioners preparing for higher exams, and for researchers and teachers in the field

Angiogenesis describes the formation of new blood vessels, which arise as outgrowths from existing vessels. In many physiological processes such as ovulation and wound healing angiogenesis is involved for a relatively short time. Otherwise under normal physiological conditions in the adult organism angiogenesis is an extremely slow process. By contrast in certain disease states such as diabetic retinopathy, arthritis, chronic inflammation, hemangiomas, etc., angiogenesis persists and contributes to the pathology of these disease states. Some 50 such "angiogenic diseases" have been described where angiogeneSiS is involved. Also in tumor growth and metastasis angiogenesis is an essential process and precedes neoplastic transformation. Hence, angiogenesis could become an important diagnostic tool and a target for developing therapeutic agents. This book contains the proceedings of the NATO Advanced Study Institute on "Angiogenesis in Health and Disease" held in Porto Hydra, Greece, from June 16-27, 1991. This meeting was a comprehensive review of endothelial cell biology and endothelial cell phenotypic and functional heterogeneity in relation to

angiogenesis under physiological and pathological conditions. Numerous in vitro and in vivo models were presented, which are used to study angiogenesis at the molecular and cellular levels and to evaluate chemical compounds or naturally occuring substances for their effect on angiogenesis. The presentations and discussions at this meeting provided an opportunity for the basic science and the clinical disciplines to meet, exchange information and provide future research directions for many investigators engaged in the study of angiogenesis. Once viewed solely as fat storage cells, adipocytes and their adipokines have now been proven to be central for human health. Understanding that overweight and obesity may increase the risk for various diseases requires detailed characterization of adipokine function. Weight gain, weight regain, and fasting affect adipocyte health and accordingly their secretome. Different adipose tissue deposits exist and they vary in cellular composition and function. The evidence is strong of a role of adipokines in cancer, reproductive function, neurological diseases, cardiovascular diseases ,and rheumatoid arthritis. Adipokines are considered useful biomarkers for adipose tissue and metabolic health, and may be used as diagnostic tools in rheumatoid arthritis, cancer, or sepsis. This book contains 10 original articles and 9 review articles focusing on these bioactive peptides. Several

articles deal with chemerin, an adipokine discovered more than 20 years ago. Data so far have resulted in promising insights related to its biological function. We are only beginning to understand the multiple roles of chemerin, the mechanisms regulating its activity, and the signaling pathways used by this chemokine. Adipokine receptor agonists and antagonists may result in the formulation of novel drugs and ultimately may lead to new therapeutic targets to be used in clinical practice.

In the past, neutrophils were often reduced to their ability to release preformed mediators and kill pathogens. The present volume of Chemical Immunology and Allergy, however, offers a very broad and timely view by highlighting the versatile functions of neutrophils in inflammatory, immune and antitumoral responses. Leading investigators uncover novel aspects of neutrophils, such as their capacity to control gene expression at the transcriptional level, or respond to proinflammatory cytokines, cytokine receptor chains (gc) and endogenous anti-inflammatory lipid mediators. Further points under discussion are neutrophils presenting antigens, activating T cells, participating in chemokine networking, and producing IL-12 and other cytokines during infectious diseases. Among the most original findings presented in this publication figure the observations that neutrophils cause increased vascular permeability during acute

inflammation, regulate directly the angiogenic process, and influence tumor development. A final article offers a detailed description of the molecular processes affecting neutrophil cell death and survival. Unique in its field, this valuable volume is recommended reading not only for immunologists and pathologists, but also for cell biologists, hematologists and immunobiologists.

Macrophages are the sentinels of the immune system whose role has evolved beyond providing aseptic conditions to homeostasis, immune regulation, development, and behaviour. These cells have varied ontogenetic origins which reflects in their phenotypic and functional heterogeneity. Macrophage functions are fine-tuned by exogenous and endogenous signals and once tweaked, the information is included in their genetic makeup, albeit not indefinitely. Subversion of the macrophage functions is the hallmark of many pathogenic organisms and modulation of macrophage activity is pivotal to many therapeutic strategies. Fascinating and rapid developments in this field have necessitated the maintenance of currency of knowledge. This book provides a current account of information on varied topics in macrophage biology. Literature surveys have been presented in a captivating and lucid language. The contributing authors have also provided brief accounts of their own research. Every chapter provides a future

perspective of what more could be achieved in the context of the current knowledge. The book will be of interest to students and researchers in microbiology, immunobiology, translational research, pathology, and related fields.

Revealing essential roles of the tumor microenvironment in cancer progression, this book focuses on the role of hematopoietic components of the tumor microenvironment. Further, it teaches readers about the roles of distinct constituents of the tumor microenvironment and how they affect cancer development. Topics include neutrophils, basophils, T helper cells, cytotoxic lymphocytes, fibrocytes, and myeloid-derived suppressor cells, and more. Taken alongside its companion volumes, these books update us on what we know about various aspects of the tumor microenvironment as well as future directions. Tumor Microenvironment: Hematopoietic Cells – Part A is essential reading for advanced cell biology and cancer biology students as well as researchers seeking an update on research in the tumor microenvironment.

Angiogenesis, the formation of new blood vessels, is fundamental for physiological processes such as embryonic and postnatal development, wound repair, and reproductive functions. Angiogenesis plays a major role in tumor growth and in several autoimmune and allergic disorders. Lymphangiogenesis, the formation of new lymphatic

vessels, is also important for tumor growth, the formation of metastasis, and chronic inflammatory diseases. Judah Folkman, a pioneer in the study of angiogenesis, first proposed that macrophages and mast cells could be a relevant source of angiogenic factors. Since then, much effort has gone into the elucidation of the role of immune cells in the modulation of angiogenesis and lymphangiogenesis. There is now compelling evidence that several components of the innate and adaptive immune system are implicated in inflammatory and neoplastic angiogenesis and lymphangiogenesis. Articles in this volume deal with the emerging, intriguing possibility that immune cells are both a source and a target of angiogenic and lymphangiogenic factors. Therefore, cells of the immune system might play a role in inflammatory and neoplastic angiogenesis/lymphangiogenesis through the expression of several angiogenic factors and their receptors and co-receptors. The important new findings in this volume will be of special interest to vascular biologists, basic and clinical immunologists, oncologists and to specialists in allergic and immune disorders.

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.

This comprehensive reference work provides a detailed overview of shockwave therapy, a relatively new clinical specialty in modern medicine. It follows the evolution of Extracorporeal Shockwave Therapy (ESWT) from its initial stage as the gold standard for the disintegration of kidney stones to its regenerative effects in biological tissues. Starting with the basic principles of shockwave treatment, the book goes on to review its application in musculoskeletal disorders,

including osteonecrosis of the hip, tendinopathy, fracture treatment, and treatment of sports related injuries. The application of ESWT in cardiovascular diseases is discussed. This includes preclinical and clinical applications for ischemic cardiovascular disease and effects on angiogenesis and anti-inflammation-molecular-cellular signaling pathways. The treatment of urinary diseases and erectile dysfunction by ESWT is elaborated. The book concludes with a discussion of future prospects of the shockwave therapy. Scholars and research fellows interested in shockwave medicine will benefit greatly from this work. It is also a useful clinical resource for nephrologists, urologists, cardiologists, and orthopedists.

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 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.

This book provides readers with an up-to-date and comprehensive view on the resolution of inflammation and on new developments in this area, including pro-resolution mediators, apoptosis, macrophage clearance of apoptotic cells, possible novel drug developments.

This book is focused on the analysis of the role played by immune cell components in the angiogenic process associated with inflammation and tumor growth. Both innate

and adaptive immune cells are involved in the mechanisms of endothelial cell proliferation, migration and activation, through the production and release of a large spectrum of pro-angiogenic mediators. These may create the specific microenvironment that favors an increased rate of tissue vascularization. The link between chronic inflammation and tumorigenesis was first proposed by Rudolf Virchow in 1863 after the observation that infiltrating leukocytes are a hallmark of tumors and first established a causative connection between the lymph reticular infiltrate at sites of chronic inflammation and the development of cancer. Tumors were described as wounds that never heal and surgeons have long described the tendency of tumors to recur in healing resection margin and it has been reported that wound healing environment provides an opportunistic matrix for tumor growth. As angiogenesis is the result of a net balance between the activities exerted by positive and negative regulators, this book will also provide information on some anti-angiogenic properties of immune cells that may be utilized for a potential pharmacological use as anti-angiogenic agents in inflammation as well as in cancer. The work is written for researchers in the field and also for graduate students which approach this matter.

Volume 12 of the world-renowned Trophoblast Research series, devoted to placental science.

Angiogenesis, the development of new blood vessels from the existing vasculature, is essential for physiological growth and over 18,000 research articles have been published describing the role of angiogenesis in over 70 different diseases, including cancer, diabetic retinopathy, rheumatoid arthritis and psoriasis. One of the most important technical challenges in such studies has been finding suitable methods for assessing the effects of regulators of eh angiogenic response. While increasing numbers of angiogenesis assays

are being described both in vitro and in vivo, it is often still necessary to use a combination of assays to identify the cellular and molecular events in angiogenesis and the full range of effects of a given test protein. Although the endothelial cell - its migration, proliferation, differentiation and structural rearrangement - is central to the angiogenic process, it is not the only cell type involved. the supporting cells, the extracellular matrix and the circulating blood with its cellular and humoral components also contribute. In this book, experts in the use of a diverse range of assays outline key components of these and give a critical appraisal of their strengths and weaknesses. Examples include assays for the proliferation, migration and differentiation of endothelial cells in vitro, vessel outgrowth from organ cultures, assessment of endothelial and mural cell interactions, and such in vivo assays as the chick chorioallantoic membrane, zebrafish, corneal, chamber and tumour angiogenesis models. These are followed by a critical analysis of the biological end-points currently being used in clinical trials to assess the clinical efficacy of anti-angiogenic drugs, which leads into a discussion of the direction future studies should take. This valuable book is of interest to research scientists currently working on angiogenesis in both the academic community and in the biotechnology and pharmaceutical industries. Relevant disciplines include cell and molecular biology, oncology, cardiovascular research, biotechnology, pharmacology, pathology and physiology.

Gene therapy, bioengineered skin, and other methods in advanced biology are revolutionizing the treatment of wounds. Written by experts in research and clinical practice, Cutaneous Wound Healing examines the current knowledge and emerging treatment methods. This volume explains the normal molecular and cellular functions that occur when a wound heals, as well as dysfunctional events, such as a

chronic wound or an ulcer. Such dysfunctions signal an imbalance in the body, explained here along with possible treatments. The book's mini-atlas is an indispensable reference tool. Dermatologists, plastic surgeons, and general practitioners can benefit from this text.

Architecture and Control addresses the urgent question residing at the intersection of architectural and cultural theory: how can the interplay between designed structures and practices of control foster an emergence of the unforeseen and the uncontrolled in post-2000 architectures and infrastructures?

Angiogenesis, Lymphangiogenesis and Clinical ImplicationsKarger Medical and Scientific Publishers

Cardiovascular immunology is a newly emerging research area, investigating the crosstalk between the cardiovascular and the immune system. This crosstalk is evident through (1) crucial immunological capacities and functions of cardiovascular cell types, including cardiomyocytes, fibroblasts, endothelial cells, pericytes and cardiac resident macrophages, (2) the impact of aberrant immune function on the development of cardiovascular disease such as atherosclerosis, direct and indirect immune-mediated heart disease and vasculitis, and (3) the crucial role of the immune system in cardiac repair and regeneration. The Immunology of Cardiovascular Homeostasis and Pathology covers all these aspects of cardiovascular immunology, starting with homeostatic immunological functions of traditional cardiovascular cell types, and moving then to the role of the immune system in cardiovascular

pathology and to recent research into targeting the immune system to boost cardiac healing and regeneration.

Natural Killer (NK) cells are large granular lymphocytes of the innate immune system. They are widespread throughout the body, being present in both lymphoid organs and non-lymphoid peripheral tissues. NK cells are involved in direct innate immune reactions against viruses, bacteria, parasites and other triggers of pathology, such as malignant transformation, all of which cause stress in affected cells. Importantly, NK cells also link the innate and adaptive immune responses, contributing to the initiation of adaptive immune responses and executing adaptive responses using the CD16 FcgRIIIA immunoglobulin Fc receptor. Such responses are mediated through two major effector functions, the direct cytolysis of target cells and the production of cytokines and chemokines. The authors focus here on the nature of recognition events by NK cells and address how these events are integrated to trigger these distinct and graded effector functions.

Transcription depends on an ordered sequence of events, starting with (i) setting of the enhancer and chromatin environment, (ii) assembly of DNA binding and general transcription factors, (iii) initiation, elongation, processing of mRNA and termination, followed by (iv) creation of epigenetic marks and

memory formation. Highlighting the importance of these activities, more than 10% total genes are dedicated to regulating transcriptional mechanisms. This area of research is highly active and new insights are continuously being added to our knowledge. Cells of the immune system have unique features of gene regulation to support diverse tasks required for innate and adaptive immunity. Innate immunity involves the recognition of external infectious and noxious agents as well as internal cancer cell components, and the elimination of these agents by non-specific mechanisms. Adaptive immunity involves gene rearrangement to achieve highly specific T and B cell responses, imparting the capability of self and non-self discrimination. This requires transcription and epigenetic regulation. Adaptive immunity also employs epigenetic memory, enabling recapitulation of prior transcription. Recent advances in nuclear architecture, chromatin structure, and transcriptional regulation have provided new insights into immune responses. The increased understanding of these molecular mechanisms is now affording opportunities to improve therapeutic strategies for various diseases. 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.

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

Novel molecular motifs named Immunoreceptor Tyrosine-based Inhibition Motifs (ITIMs) have recently been recognized in the intracytoplasmic domains of a still-increasing number of receptors which control cell activation and proliferation. Research on ITIM-bearing molecules has developed exponentially during the last three years, generating new concepts with important consequences in basic research and with exciting potential clinical applications. The present volume contains 15 reviews written by authors who all made significant contributions to the identification of ITIM-bearing molecules and the study of their biological properties. It constitutes the first synthesis ever published that is specifically devoted to this emerging topic.

The inflammasome was first described in 2002 as a molecular complex activating proinflammatory caspases and therefore regulating the maturation and biological activities of cytokines such as IL-1? and IL-18. This finding was substantiated by the identification of several mutations in the cias1 gene, encoding the human NLRP3 protein, responsible for several autoinflammatory disorders such as the Muckle Wells syndrome. Since, the interest for this complex has constantly increased and several inflammasome complexes with different specificities have been described. These inflammasomes sense a wide variety of pathogens and danger signals and are key players in the inflammatory response. With the contributions of leading international experts in the field, this book provides an extensive overview of the current knowledge of inflammasome biology and their role in health and disease.

We now know that excessive angiogenesis contributes to the development of a variety of disease processes, including cancer, chronic inflammatory disease, and diabetic retinopathy. On the other hand, insufficient angiogenesis may impair wound healing and organ repair. This volume describes recent advances in understanding the molecular regulation of angiogenesis. Subjects covered include important pro-angiogenic growth factors (e.g., vascular endothelial growth factor/vascular permeability factor, scatter

factor/hepatocyte growth factor) and their receptors; angiogenesis inhibitors (e.g., thrombospondin-1, angiostatin); extracellular matrix factors (e.g., laminin) and specific vascular integrins (avb3 and avb5) that regulate angiogenesis; the roles of fibrin and the fibrinolytic system in angiogenesis; physical factors that regulate angiogenesis (hypoxia, pH); mechanisms by which specific cell types (macrophages, pericytes) regulate angiogenesis; and lymphangiogenesis, a subject often ignored in volumes of this type. Several chapters are also devoted to the prognostic and therapeutic implications of tumor angiogenesis, a subject of great interest to clinicians. Reflecting the latest advances in this exciting and expanding field, this comprehensive and authoritative monograph will prove invaluable to cell biologists, cancer researchers and pharmacologists.

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. Part of the APCs for articles in this collection were financed by the Fondazione Beppe e Nuccy Angiolini ONLUS.

Publisher’s note: In this 2nd edition,

acknowledgment for the Fondazione Beppe e Nuccy Angiolini ONLUS has been added.

The aim of this book is to give readers a broad review of burn injuries, which may affect people from birth to death and can lead to high morbidity and mortality. The book consists of four sections and seven chapters. The first section consists of the introductory review chapter, which overviews the burn injuries. The second section includes chapter "Burn Etiology and Pathogenesis," which focuses on burn injuries and clinical findings. The third section consists of chapter "Controlling Inflammation in Burn Injury" and is devoted to the role of inflammatory response, which is fundamental to the healing process, while a prolonged inflammation may lead to scarring and fibrosis. The fourth section consists of four chapters as follows: "Therapeutic Effects of Conservative Treatments on Burn Scars," "Herbal Therapy for Burns and Burn Scars," "Platelet-Rich Plasma in Burn Treatment," and "Surgical Treatment of Burn Scars." The book is easy to read and includes hot topics on burn injury to enhance the reader's understanding and knowledge.

Angiogenesis is the physiological process where new blood vessels grow from existing ones, in order to replenish tissues suffering from inadequate blood supply. Perhaps the most studied angiogenic process occurs in solid tumors whose growing mass and expanding cells create a constant demand for

additional supply of oxygen and nutrients for survival. However, other physiological and clinical conditions, such as wound healing, ischemic events, autoimmune and age-related diseases also involve angiogenesis. Angiogenesis is a well-structured process that begins when oxygen and nutrients are depleted, leading to the release of chemokines and growth factors that attract immune cells, particularly macrophages and endothelial cells to the site. Macrophages that are recruited to the site, as well as tissue cells and endothelial cells, secrete pro-angiogenic mediators that affect endothelial cells and promote angiogenesis. These mediators include growth factors such as vascular endothelial cell growth factor (VEGF), matrix metalloproteinases (MMPs), as well as low levels of mediators that are usually seen as pro-inflammatory but are pro-angiogenic when secreted in low levels (e.g. nitric oxide (NO) and TNFa). Thus, macrophages play a major role in angiogenesis. Macrophages exhibit high plasticity and are capable of shifting between different activation modes and functions according to their changing microenvironment. Small differences in the composition of activating factors (e.g. TLR ligands such as LPS, anti-inflammatory cytokines, ECM molecules) in the microenvironment may differently activate macrophages to yield classically activated macrophages (or M1 macrophages) that can kill pathogen and tumor cells, alternatively

activated macrophages (or M2 macrophages) that secrete antiinflammatory cytokines, resolution macrophages (rM?) that are involved in the resolution of inflammation, or regulatory macrophages (e.g. Myeloid-Derived Suppressor Cells - MDSCs) that control the function of other immune cells. In fact, macrophages may be activated in a spectrum of subsets that may differently contribute to angiogenesis, and in particular non-classically activated macrophages such as tumor-associated macrophages (TAMs) and Tie2-expressing monocytes (TEMs) can secrete high amounts of pro-angiogenic factors (e.g. VEGF, MMPs) or low levels of pro-inflammatory mediators (e.g. NO or TNFa) resulting in pro-angiogenic effects. Although the importance of macrophages as major contributors and regulators of the angiogenic process is well documented, less is known about the interactions between macrophages and other cell types (e.g. tumor cells, normal epithelial cells, endothelial cells) that regulate angiogenesis. We still have only limited understanding which proteins or complexes mediate these interactions and whether they require cell-cell contact (e.g. through integrins) or soluble factors (e.g. the EGF-CSF-1 loop), which signaling pathways are triggered in each of the two corresponding cell types, and how this leads to secretion of pro- or antiangiogenic factors in the microenvironment. The regulation of such

interactions and through them of angiogenesis, whether through post-translational modifications of proteins or via the involvement of microRNA, is still unclear. The goal of this Research Topic is to highlight these interactions and their regulation in the context of both physiological and pathological conditions.

Tumor-Induced Immune Suppression - Prospects and Progress in Mechanisms and Therapeutic Reversal presents a comprehensive overview of large number of different mechanisms of immune dysfunction in cancer and therapeutic approaches to their correction. This includes the number of novel mechanisms that has never before been discussed in previous monographs. The last decades were characterized by substantial progress in the understanding of the role of the immune system in tumor progression. Researchers have learned how to manipulate the immune system to generate tumor specific immune response, which raises high expectations for immunotherapy to provide breakthroughs in cancer treatment. It is increasingly clear that tumor-induced abnormalities in the immune system not only hampers natural tumor immune surveillance, but also limits the effect of cancer immunotherapy. Therefore, it is critically important to understand the mechanisms of tumor-induced immune suppression to make any progress in the field and this monograph provides these

important insights.

Kidney cancer imposes a significant cancer burden and its incidence continues to rise globally. Mortality in advanced kidney cancer remains high despite oncological, surgical and multimodal optimisation. Genetic associations, heterogeneity and limitations in early diagnosis through lack of optimal biomarkers add to the challenges. Over the last two decades there has been an exponential increase in diagnostic and therapeutic advances in the management of kidney cancer. The coupling of scientific advances in engineering and technology with oncological therapeutics has recently ushered a renewed optimism. The role of minimally invasive approaches through focal therapy and surgical extirpation using the robotic platform has been unprecedented and paramount. Virtual augmentation and mixed reality platforms have proved useful supplementary tools in surgical planning. The role of surgical simulation and training in development of surgeons with the optimal skill set is essential to provide optimal care. This book is the first in a series that explores the evolving trends in kidney cancer. The focus of the book is broad and includes topics ranging from immunotherapy to surgical simulation. Some chapters explore leading edge concepts while others capture the evolving trends and future concepts. The Editors aim to stimulate the readers to explore the key concepts and to encourage research and

innovation along the main themes presented.