Extracellular Vesicles In Health And Disease

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The Innate Immune System in Health and Disease: Jorge Morales Montor 2022 "The aim of this book, The Innate Immune System in Health and Disease: From the Lab Bench Work to Its Clinical Implications, is to provide updated information to scientists and clinicians that is valuable in their quest to gather information, carry out new investigations, and develop novel drugs that are more effective and do not cause adverse effects targeting the innate immune system. This book is of high priority to people interested in an update on innate immunity. The Volume 1 examines the participation of innate immunity in diseases such as infections by viruses, cancer, or parasites. Specifically, this volume discusses innate immunity as it relates to chronic HIV infection, type 2 diabetes, and SARS-CoV-2, as well as its relationship with vitamin D. The dual role of neutrophils in cancer development and the plasticity of natural killer cells are investigated. Also, the immune response to infections from helminth and Toxoplasma gondii are described. Volume 2 examines topics such as the participation of the innate immune system in homeostasis and in the pathogenesis of chronic inflammatory diseases, the innate immune response and its modulation by sex hormones during chronic lung inflammation, and asthma beyond adaptive immunity. Moreover, the role of TLRS during arthritis rheumatoid onset and development is discussed as well as the modulation of the innate immune system by extracellular vesicles. Furthermore, a novel strategy to interrupt the transmission of diseases by mosquitoes and the modulation of the innate immune system by the endocrine disrupting

compounds bisphenol A (BPA) and phthalates are discussed. The Innate Immune System in Health and Disease: From the Lab Bench Work to its Clinical Implications promises to be a must-have book for all people who want to know about the role of the basic functioning of the innate immune system in several diseases of actual relevance to human health"--
Exosomes in Cardiovascular Diseases Junjie Xiao 2017-09-19 The book provides and intensive overview on exosomes in cardiovascular diseases, its potential as biomarkers, as well as pathological and therapeutic effects. It firstly describes the general aspects of exosomes including the definition, formation and secretion of exosomes and highlight their roles as biomarkers and pathological and therapeutic effects in cardiovascular diseases as well. Secondly, basic aspects of exosomes including the purification methods of exosomes, exosomes content, and functional roles of the cardiovascular exosomes are summarized. Thirdly, exosomes as biomarkers of cardiovascular diseases are overviewed including their roles in diagnosis, prognosis and reaction to therapy. Fourthly, pathological effects of exosomes and therapeutic effects of exosomes are highlighted. Finally, future prospects of exosomes in cardiovascular research would be provided. This is an essential reference for researchers working in cell biology and regeneration, as well as clinicians such as cardiologist.
Central Nervous System Extracellular Vesicles Dominic Martin Walsh 2020-08-21
The Liver Irwin M. Arias 2020-01-22 Bridging the gap between basic scientific advances and the understanding of liver disease — the extensively revised new edition of the premier text in the field. The latest edition of The Liver: Biology and Pathobiology remains a definitive volume in the field of hepatology, relating advances in biomedical sciences and engineering to understanding of liver structure, function, and disease pathology and treatment. Contributions from leading researchers examine the cell biology of the liver, the pathobiology of liver disease, the liver’s growth, regeneration, metabolic functions, and more. Now in its sixth edition, this classic text has been exhaustively revised to reflect new discoveries in biology and their influence on diagnosing, managing, and preventing liver disease. Seventy new chapters — including substantial original sections on liver cancer and groundbreaking advances that will have significant impact on hepatology — provide comprehensive, fully up-to-date coverage of both the current state and future direction of hepatology. Topics include liver RNA structure and function, gene editing, single-cell and single-molecule genomic analyses, the molecular biology of hepatitis, drug interactions and engineered drug design, and liver disease mechanisms and therapies. Edited by globally-recognized experts in the field, this authoritative volume: Relates molecular physiology to understanding disease pathology and treatment Links the science and pathology of the liver to practical clinical applications Features 16 new “Horizons” chapters that explore new and emerging science and technology Includes plentiful full-color illustrations and figures The Liver: Biology and Pathobiology, Sixth Edition is an indispensable resource for practicing and trainee hepatologists, gastroenterologists, hepatobiliary and liver transplant surgeons, and researchers

and scientists in areas including hepatology, cell and molecular biology, virology, and drug metabolism.
Extracellular Vesicles 2020-11-08 Extracellular Vesicles, Volume 645 in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. Chapters in this new release include Genetic labeling of extracellular vesicle exosomes for studying biogenesis and uptake in living mammalian cells, Fluorescent Labeling of Extracellular Vesicles, Isolation of extracellular vesicles from lymph, Transgenic rats for tracking body fluid/tissue-derived extracellular vesicles, Isolation of amniotic extracellular vesicles, Urinary extracellular vesicle isolation, Immunocapture-based ELISA to Characterize and Quantify Extracellular Vesicles in Both Cell Culture Supernatants and Body Fluids, and much more. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Methods in Enzymology series
Exosomes and Microvesicles Andrew F. Hill 2016-12-10 This volume covers methods for the analysis of extracellular vesicles (EV) that can be applied to isolated EVs from a wide variety of sources. This includes the use of electron microscopy, tunable resistance pulse sensing, and nanoparticle tracking analysis. The chapters in this book discuss EV cargoes containing proteins and genomic materials using a number of different approaches, and isolating EVs from platelets and neuronal cells and tissues. 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. Practical and comprehensive, Exosomes and Microvesicles: Methods and Protocols is a valuable resource containing methodologies for anyone interested in researching EVs.
Extracellular Vesicles Winston Patrick Kuo 2017-08-21 This volume examines established methods and protocols to isolate and characterize extracellular vesicles (EVs) and their composition, among other techniques including purification, imaging, biofluid-specific and cell-specific isolation and downstream genomic and proteomic profiling. The international group of expert scientists who have contributed to this collection provide a variety of different techniques related to the growing assortment of EV applications, given that at times using only one technique or two is insufficient to address the question at hand. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Comprehensive and practical, Extracellular Vesicles: Methods and Protocols serves as an ideal guide for researchers seeking to expand our knowledge of EV functions and applications.
Extracellular Vesicles in Diagnosis and Therapy Maurizio Federico 2022 This detailed book provides an exhaustive picture

of current methods to detect, isolate, and analyze extracellular vesicles (EVs) from diverse sources, now seen as potential disease biomarkers as well as tools for the development of new therapies. Beginning with a section on detection and isolation of EVs, the volume continues with chapters covering different methods to isolate and quantify EVs from specialized tissues/organs and body fluids, methods devoted to analyzing EV components, as well as cutting-edge methods to engineer EVs. Written for the highly successful Methods in Molecular Biology series, 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 practical, Extracellular Vesicles in Diagnosis and Therapy serves as an ideal guide for researchers seeking to learn more about the complexities of cell-to-cell communication.

Lung Stem Cells in Development, Health and Disease Nikolic, Marko Z. 2021-04-01 Most organs in the adult human body are able to maintain themselves and undergo repair after injury; these processes are largely dependent on stem cells. In this Monograph, the Guest Editors bring together leading authors in the field to provide information about the different classes of stem cells present both in the developing and adult lung: where they are found, how they function in homeostasis and pathologic conditions, the mechanisms that regulate their behaviour, and how they may be harnessed for therapeutic purposes. The book focuses on stem cells in the mouse and human lung but also includes the ferret as an increasingly important new model organism. Chapters also discuss how lung tissue, including endogenous stem cells, can be generated in vitro from pluripotent stem cell lines. This state-of-the-art collection comprehensively covers one of the most exciting areas of respiratory science

Mesenchymal Stem Cells in Human Health and Diseases Ahmed El-Hashash 2020-01-06 Mesenchymal Stem Cells in Human Health and Diseases provides a contemporary overview of the fast-moving field of MSC biology, regenerative medicine and therapeutics. MSCs offer the potential to dramatically reduce human suffering from disease. Numerous MSC-based studies are ongoing each year, each offering hope for novel treatments in human disease. This book provides information on MSC application in well-studied human diseases and tissue repair/regeneration and recent advances in their research and treatment. These discoveries are placed within the structural context of tissue and developmental biology in sections dealing with recent advances in our understanding of MSC biology. Includes insights ranging from MSC biology and development through the derivation and identification and properties of MSCs Helps to identify potential innovative solutions for restoring normal morphogenesis and/or regeneration of diseased organs Discusses the fact-based promise of MSC therapeutics and regenerative medicine in the real world

Exosomes in Brain Health and Disease

Konstantin Glebov 2022-06-06
Biomarkers of Kidney Disease Charles L. Edelstein 2016-11-08 Biomarkers of Kidney Disease, Second Edition, focuses on the basic and clinical research of biomarkers in common kidney diseases, detailing the characteristics of an ideal biomarker. The latest techniques for biomarker detection, including metabolomics and proteomics are covered in the book. This comprehensive book details the latest advances made in the field of biomarker research and development in kidney diseases. The book is an ideal companion for those interested in biomarker research and development, proteomics and metabolomics, kidney diseases, statistical analysis, transplantation, and preeclampsia. New chapters include biomarkers of cardiovascular disease in patients with CKD, biomarkers of Polycystic Kidney Disease, and biomarkers and the role of nanomedicine. Explores both the practical and conceptual steps performed in the discovery of biomarkers in kidney disease Presents a comprehensive account of newer biomarker discover strategies, such as metabolomics and proteomics, all illustrated by clear examples Offers clear translational presentations by the top basic and clinical researchers in each specific renal disease, including AKI, transplantation, cancer, CKD, PKD, diabetic nephropathy, preeclampsia, and glomerular disease
Molecular and Cellular Biology of Platelet Formation Harald Schulze 2017-02-07 This book gives a comprehensive insight into platelet biogenesis, platelet signal transduction, involvement of platelets in disease, the use of diverse animal models for platelet research and future perspectives in regard to platelet production and gene therapy. Being written by international experts, the book is a concise state-of-the art work in the field of platelet biogenesis, biology and research. It represents an indispensable tool for research scientists in biomedicine, vascular biology, hematopoiesis and hemostasis and specifically for scientists in platelet research, as well as for clinicians in the field of hematology and transfusion medicine.?
"Message in a Bottle" Nicole Comfort 2021 Background: The physiological and pathophysiological roles of secreted membrane-enclosed vesicles known as extracellular vesicles (EVs) have become increasingly recognized, making the EV field a quickly evolving area of research. EVs and their encapsulated molecular material including microRNAs are key mediators of intercellular communication, making EVs analogous to a message in a bottle. This discovery has fundamentally changed the study of gene regulation, and understanding the central role of EVs and their cargo in health and disease will generate new opportunities for basic biology, diagnostics, and disease treatment. EV release and the packaging of molecular material into EVs can be altered by stressors such as air pollution exposure. Exposure to air pollution is associated with significant morbidity among individuals with asthma, especially children who participate in more frequent outdoor activities and are more susceptible to exposure due to their narrower airways and higher breathing

rate.
Handbook of Materials for Nanomedicine Vladimir Torchilin 2011-11 The fast developing field of nanomedicine uses a broad variety of materials to serve as delivery systems for drugs, genes, and diagnostic agents. This book is the first attempt to put under one cover all major available information about these materials, both still on experimental levels and already applied in patients.
RNA-Based Regulation in Human Health and Disease 2020-08-19 RNA-based Regulation in Human Health and Disease offers an in-depth exploration of RNA mediated genome regulation at different hierarchies. Beginning with multitude of canonical and non-canonical RNA populations, especially noncoding RNA in human physiology and evolution, further sections examine the various classes of RNAs (from small to large noncoding and extracellular RNAs), functional categories of RNA regulation (RNA-binding proteins, alternative splicing, RNA editing, antisense transcripts and RNA G-quadruplexes), dynamic aspects of RNA regulation modulating physiological homeostasis (aging), role of RNA beyond humans, tools and technologies for RNA research (wet lab and computational) and future prospects for RNA-based diagnostics and therapeutics. One of the core strengths of the book includes spectrum of disease-specific chapters from experts in the field highlighting RNA-based regulation in metabolic & neurodegenerative disorders, cancer, inflammatory disease, viral and bacterial infections. We hope the book helps researchers, students and clinicians appreciate the role of RNA-based regulation in genome regulation, aiding the development of useful biomarkers for prognosis, diagnosis, and novel RNA-based therapeutics. Comprehensive information of non-canonical RNA-based genome regulation modulating human health and disease Defines RNA classes with special emphasis on unexplored world of noncoding RNA at different hierarchies Disease specific role of RNA - causal, prognostic, diagnostic and therapeutic Features contributions from leading experts in the field
Extracellular Vesicles in Health and Disease Paul Harrison 2014-05-02 Interest in the role of extracellular vesicles (microvesicles and exosomes) is expanding rapidly. It is now apparent that far from being merely cellular debris, these vesicles play a key role in cell-to-cell communication and signaling. Moreover, they are significantly elevated in a number of diseases. This raises the question of their direct role in pathogenesis as well as their possible use as biomarkers. This book stems from the first international meeting on "Microvesicles and Nanovesicles in Health and Disease" held at Magdalen College, Oxford, in 2010. The purpose of the meeting was to bring together, for the first time, a range of experts from around the world to discuss the latest advances in this field. Key to the study of these vesicles is the availability of methodologies for their measurement in biological fluids. A major section of the meeting focused on a range of exciting new technologies which have been developed for this purpose. The presentations at this meeting form the basis of this

book, which will appeal to basic scientists, clinicians, and those developing technology for the measurement of extracellular vesicles.

The Innate Immune System in Health and Disease: from the Lab Bench Work to Its Clinical Implications. Volume 1 Jorge Morales-Montor 2022-02-28 The aim of this book, The Innate Immune System in Health and Disease: From the Lab Bench Work to Its Clinical Implications. Volume 1, is to provide updated information to scientists and clinicians that is valuable in their quest to gather information, carry out new investigations, and develop novel drugs that are more effective and do not cause adverse effects targeting the innate immune system. This book is of high priority to people interested in an update on innate immunity. Volume 1 examines the participation of innate immunity in diseases such as infections by viruses, cancer, or parasites. Specifically, this volume discusses innate immunity as it relates to chronic HIV infection, type 2 diabetes, and SARS-CoV-2, as well as its relationship with vitamin D. The dual role of neutrophils in cancer development and the plasticity of natural killer cells are investigated. Also, the immune response to infections from helminth and Toxoplasma gondii are described. The Innate Immune System in Health and Disease: From the Lab Bench Work to its Clinical Implications. Volume 1 promises to be a must-have book for all people who want to know about the role of the basic functioning of the innate immune system in several diseases of actual relevance to human health.

Diabetic Nephropathy Luigi Gnudi 2020-11-22 This book provides a toolkit of novel research approaches for investigators to study diabetic nephropathy, including critical experimental models from the fly to the fish, cells in culture, and in vivo mammalian approaches. The collection also explores powerful techniques to image the kidney, such as traditional histological techniques as well as electron, confocal, and two-photon microscopy, pathophysiology of the diabetic kidney, and gene editing and regenerative medicine. Written for the highly successful Methods in Molecular Biology series, 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 practical, Diabetic Nephropathy: Methods and Protocols seeks to foster new research directions and inspire ideas to enhance our understanding of diabetic nephropathy and to develop treatments for this condition.

Glial Cells in Health and Disease Anjali Balakrishnan . 2020 Glial cells are often considered to be 'supporting cast' members in the nervous system, with ancillary roles in providing nutrient and structural support to neurons. However, glial cells have many essential roles, including the myelination of nerves to allow information to be transmitted rapidly and efficiently. My thesis has largely focused on the role of myelinating glial cells in health and disease. I first studied a population of malignant oligodendrocyte-like cells that form glial tumors in the central nervous system, called oligodendroglioma. For the rest of my thesis, I focused on Schwann cells in the peripheral nervous system. In Chapter 2 of

my thesis, I describe my investigation into the role of extracellular vesicles in controlling oligodendroglioma growth by mediating heterotypic and homotypic cell-cell interactions. I revealed that oligodendroglioma tumor cells secrete extracellular vesicles that carry cytotoxic cargo to induce cell death in neighboring cells. Furthermore, I implicated a gene involved in extracellular vesicle biogenesis, SMPD3, in negatively regulating oligodendroglioma growth by controlling the synthesis of extracellular vesicles (Chapter 2). I then studied the development of Schwann cells, and their transition into repair Schwann cells post nerve injury. I characterized the dynamic expression patterns of a panel of transcriptional regulators during development and in repair Schwann cells post-injury (Chapter 3). I then used this panel of markers to ask whether the ets domain transcription factor Etv5, expressed transiently in Schwann cell precursors, played a role in regulating Schwann cell development and in repair Schwann cells by using a hypomorphic Etv5 mutant mouse model (Chapter 4). While Etv5 mutants had no apparent defects in Schwann cell development, I describe several important caveats and future considerations. Finally, I performed the first steps towards developing a non-integrative, triple transcription factor mediated lineage conversion strategy for the generation of induced repair Schwann cells from mouse embryonic fibroblasts (Chapter 5). In conclusion, I have gained new insights on how glial cells in a healthy and diseased state are regulated. My findings have therapeutic implications for the treatment of oligodendroglioma tumors in the central nervous system, and for peripheral nerve repair.

The Role of the Muscle Secretome in Health and Disease Céline Aguer 2020-11-19

Novel Implications of Exosomes in Diagnosis and Treatment of Cancer and Infectious Diseases Jin Wang 2017-07-12 The aim of this book is to provide an overview of the importance of exosomes in the biomedical field, which involves in novel implications of exosomes in diagnosis and treatment of cancer and infectious diseases. The book would definitely be an ideal source of scientific information of exosomes to researchers and scientists involved in biomedicine, biology, and other areas involving cancer and infectious diseases.

Extracellular Vesicles and Their Importance in Human Health Ana Gil De Bona 2020-03-04 Extracellular vesicle is a wide term that involves many different types of vesicles. Almost all the cell types studied secrete vesicles to the extracellular environment related to cell - cell communication. Extracellular vesicles have been found in different biological fluids, such as blood, milk, saliva, tears, urine, and cerebrospinal fluid. These vesicles transport different molecules, including mRNA, proteins, and lipids, some of them cell type specific that make them ideal biomarkers in both health and disease conditions. However, their contribution to different conditions is not well understood. The aim of this book is to provide an overview of the extracellular vesicles in the human body, how they are internalized, and their participation in several

diseases.
Fungal Extracellular Vesicles Marcio Rodrigues
Janeway's Immunobiology Kenneth Murphy 2010-06-22 The Janeway's Immunobiology CD-ROM, Immunobiology Interactive, is included with each book, and can be purchased separately. It contains animations and videos with voiceover narration, as well as the figures from the text for presentation purposes.
Extracellular Vesicles in Infectious Diseases Shulamit Michaeli 2021-07-22
Pathogenesis, Treatment and Prevention of Leishmaniasis Mukesh Samant 2021-08-18 Leishmaniasis is a neglected tropical disease that is known to be transmitted by 90 different species of sandflies which carry 20 Leishmania species that cause human infection particularly in endemic countries. Pathogenesis, Treatment, and Prevention of Leishmaniasis aims to provide information on this vector-borne disease and explore strategies for diagnosis and treatment. The book begins with an overview of leishmaniasis which includes historical and future perspectives of the disease. It also discusses the clinical manifestation of the disease, mechanisms of infection, therapeutic strategies, diagnostics, prevention, and cure of Leishmania parasite. The book goes on to explain new insights and challenges in the development of promising drug targets, biomarkers identification and advance vaccination strategies against leishmaniasis. Chapter contributions brings together diverse areas of expertise making Pathogenesis, Treatment, and Prevention of Leishmaniasis aims to bring together elements of leishmaniasis into one place and be a valuable resource for researchers, health care professionals, and graduate students, working in the field of leishmaniasis. Provides an overview Leishmania and leishmanisis which include its history, transmission, clinical picture, and treatment Discusses novel approaches to study parasite infection and treatment Explores recent advances in the development of diagnostic kits, drug development and various vaccination strategies
Tau oligomers Jesus Avila 2014-08-18 Neurofibrillary tangles (NFTs) composed of intracellular aggregates of tau protein are a key neuropathological feature of Alzheimer’s Disease (AD) and other neurodegenerative diseases, collectively termed tauopathies. The abundance of NFTs has been reported to correlate positively with the severity of cognitive impairment in AD. However, accumulating evidences derived from studies of experimental models have identified that NFTs themselves may not be neurotoxic. Now, many of tau researchers are seeking a “toxic” form of tau protein. Moreover, it was suggested that a “toxic” tau was capable to seed aggregation of native tau protein and to propagate in a prion-like manner. However, the exact neurotoxic tau species remain unclear. Because mature tangles seem to be non-toxic component, “tau oligomers” as the candidate of “toxic” tau have been investigated for more than one decade. In this topic, we will discuss our consensus of “tau oligomers” because the term of “tau oligomers” [e.g. dimer (disulfide bond-

dependent or independent), multimer (more than dimer), granular (definition by EM or AFM) and maybe small filamentous aggregates] has been used by each researchers definition. From a biochemical point of view, tau protein has several unique characteristics such as natively unfolded conformation, thermo-stability, acid-stability, and capability of post-translational modifications. Although tau protein research has been continued for a long time, we are still missing the mechanisms of NFT formation. It is unclear how the conversion is occurred from natively unfolded protein to abnormally mis-folded protein. It remains unknown how tau protein can be formed filaments [e.g. paired helical filament (PHF), straight filament and twisted filament] in cells albeit in vitro studies confirmed tau self-assembly by several inducing factors. Researchers are still debating whether tau oligomerization is primary event rather than tau phosphorylation in the tau pathogenesis. Inhibition of either tau phosphorylation or aggregation has been investigated for the prevention of tauopathies, however, it will make an irrelevant result if we don’t know an exact target of neurotoxicity. It is a time to have a consensus of definition, terminology and methodology for the identification of “tau oligomers”.

Exosomes Larry Edelstein 2019-10-16 Exosomes: A Clinical Compendium is a comprehensive and authoritative account of exosomes in the context of biomarkers, diagnostics, and therapeutics across a wide spectrum of medical disciplines, as well as their role in cell-cell communication. It is intended to serve as a reference source for clinicians, physicians, and research scientists who wish to gain insight into the most recent advances in this rapidly growing field. The exosome revolution may well be the greatest advance in physiology and medicine since antibiotics. The discovery of their epigenetic role in intercellular signaling in virtually all tissues is a major breakthrough in our understanding of how cells function. Provides readers with a broad and timely overview of exosomes in health and disease, closing with a thought-provoking chapter on transgenerational inheritance, Darwin and Lamarck. Summarizes the most recent laboratory and clinical findings on exosomes across numerous medical disciplines, thereby offering readers a broad-ranging and solid foundation for prospective investigative efforts Twenty-one chapters authored by a global team of peer-acknowledged experts, each representing a key medical disciplineProvides readers with a broad and timely overview of exosomes in health and disease, closing

New Frontiers 2021 The field of extracellular vesicles (EVs) has progressed immensely in recent times with evidences highlighting their importance in physiology and pathology. This book entails extensive reflective literature on many subtypes of EVs including exosomes, exomeres, ectosomes, apoptotic vesicles, bacterial EVs and fungal EVs. The book further discusses the biogenesis and secretion of these EVs, detailing the biological pathways and proteins involved. Research investigating the biological functions of EVs is rapidly increasing and the current knowledge around their role in progression of diseases such as cancer, neurodegeneration and metabolic disorders is discussed in multiple chapters.

The implications of EVs in intercellular communication and the significance of biologically active cargo carried within these EVs are further examined. Moreover, the numerous applications of EVs in diagnostics and treatment of diseases are reviewed in detail, particularly their potential as biomarkers and drug delivery vehicles. Taken together, this book is a compilation of the key implications of EVs that are secreted by virtually all cell types. Readers will gain a perspective into the biology, functions and applications of EVs and their constantly evolving knowledge base.

Mineralizing Vesicles Massimo Bottini 2023-03-01 Extracellular vesicles (EVs) are membranous particles released by all cell types, with sizes ranging from a few tens of nanometers up to one micron. Mineralization-competent cells release a special class of EVs known as mineralizing EVs, able to form apatite minerals. Over two decade's of research demonstrate the importance and promise of mineralizing EVs. Mineralizing Extracellular Vesicles presents, for the first time, all aspects of mineralizing EVs including their composition, function in physiological and pathological processes, and the practical aspects of their research. Sixteen chapters provide a systematic account of mineralizing EVs that will be an essential reference for researchers in biochemistry, molecular biology, engineering, endocrinology and human health. Mineralizing Extracellular Vesicles presents the state-of-the art in the properties of mineralizing EVs and their potential clinical applications. The first chapter presents foundational biochemical and biological aspects of EVs. Next, the title coves the role of EVs in bone ossification and in cardiovascular and cartilage-related diseases. Considering the unique ability of this class of EVs to form apatite minerals assigned to their special biochemical machinery, three chapters of the book then focus on the enzymes catalysing the inorganic phosphate and calcium turn-over and the dynamic properties of the vesicles' peripheral proteins. Chapters describe the role of inorganic phosphate and calcium ions and of autophagy on the biogenesis and function of mineralizing EVs. Recent studies show that the lumen of mineralizing EVs is partially filled with miRNA, and a chapter therefore considers research on the possible function of these vesicles as signalosomes. The final five chapters of the book describe practical aspects of working with mineralizing EVs, including their purification, proteomic and biophysical analyses, the use of biomimetic models and mineralizing EVs in regenerative medicine. This title presents, for the first time, a comprehensive account of mineralizing EVs and their potential clinical applications. It will be invaluable to researchers in the field.

Extracellular Vesicle-Mediated Processes in Cardiovascular Diseases Rory R. Koenen 2018-10-19 It is long known that many cells can shed extracellular vesicles, small membrane-enclosed cell fragments. Although the existence of extracellular vesicles has been recognized for many years, researchers are only beginning to understand their physiologic significance. Several recent studies have demonstrated that extracellular vesicles released from cells serve as a mode of cellular communication. They can carry diverse molecular payload (e.g. nucleic acids, bioactive lipids and proteins) to

distal organs and recipient cells. Extracellular vesicles can be classified into three major groups: exosomes, microvesicles, and apoptotic bodies. All these types of extracellular vesicles can be found in a variety of biologic specimen and their numbers, distribution and composition may serve as biomarkers for various disorders, including cardiovascular disease. Although extracellular vesicle-mediated processes are currently best characterized in the fields of cancer biology and neurobiology, evidence is accumulating that extracellular vesicles play a key role in the pathophysiology of diabetes, thrombosis, inflammation and cardiovascular calcification. In this Research Topic, we invited review and methodological articles that advance our understanding of extracellular vesicle-related processes in vascular biology.

Exosomes as Therapeutic Systems Robert Steven Conlan 2021-10-01

The Role of Glycosylation in Health and Disease Gordan Lauc 2021-09-08 Glycobiology is an emerging field of studying glycans (sugars) and glycoconjugates that are essentially involved in almost all biological processes, from fine-tuning glycoprotein function to protein-protein interactions, signaling, immune response, host-pathogen interactions, etc. However, due to structural complexity of glycans and analytical challenges this exciting field was lagging behind other areas of biology. With technological advancements growing number of glycans' functions are being discovered and the study of glycans is becoming a cutting-edge discipline in basic and clinical research. Despite recent developments in glycobiology field, many aspects of glycosylation process still remain unknown, both in a healthy human organism and in pathological states. Human glycome is dynamic and changes with physiological triggers, immune challenges and disease. Atypical glycosylation is consequently a subject of disease biomarker research, and a target for therapeutic interventions. On the other hand, properties of glycosylated biotherapeutics are predominantly determined by their glycans. The Role of Glycosylation in Health and Disease provides a comprehensive overview of types and functions of glycans in a healthy human organism as well as their role in pathophysiology of different diseases and efficiency of glycosylated biotherapeutics. Written by the experts in the field, this book aims to bring glycobiology field closer to students, researchers in life sciences and professionals in biopharmaceutical industry.

Cellular Endocrinology in Health and Disease Alfredo Ulloa-Aguirre 2021-02-02 Cellular Endocrinology in Health and Disease, Second Edition, describes the underlying basis of endocrine function, providing an important tool to understand the fundamentals of endocrine diseases. Delivering a comprehensive review of the basic science of endocrinology, from cell biology to human disease, this work explores and dissects the function of a number of cellular systems. The new edition provides an understanding of how endocrine glands function by integrating information resulting in biological effects on both local and systemic levels, also providing new information on the molecular physiopathogenesis of endocrine neoplasic cells. The new edition expands the most used chapters from the first edition and proposes a series of

substitutions and additions to the table of contents. New chapters cover signaling, brown adipose tissue, hypothalamic cell models, cellular basis of insulin resistance, genetics and epigenetics of neuroendocrine tumors, and a series of chapters on endocrine-related cancer. Providing content that crosses disciplines, Cellular Endocrinology in Health and Disease, Second Edition, details how cellular endocrine function contributes to system physiology and mediates endocrine disorders. A methods section proves novel and useful approaches across research focus that will be attractive to medical students, residents, and specialists in the field of endocrinology, as well as to those interested in cellular regulation. Editors Alfredo Ulloa-Aguirre and Ya-Xiong Tao, experts in molecular and cellular aspects of endocrinology, deliver contributions carefully selected for relevance, impact, and clarity of expression from leading field experts Explores endocrine cells biology in normal and pathologic conditions Covers new aspects of endocrine cell function in distinct tissues Provides a view into the biological effect in local and systemic levels 15 new chapters covering the recent developments in the field

Endothelial Progenitor Cells in Health and Disease Amankeldi A. Salybekov 2022-06-15 We are delighted to offer this textbook to the scientific community, entitled Endothelial Progenitor Cells in Health and Diseases, which covers a timely topic in the rapidly evolving discipline of vascular biology. Written primarily for a life science audience and clinicians, the fundamentals of EPCs biology and the latest characterization and definition in health and diseases are introduced, followed by explanations of the most cutting-edge cell therapy methods to cure ischemic diseases. In Section One, endothelial cell progenitor isolation methods and biological characterization were reported. The discovery of this novel endothelial progenitor cells (EPC) concept has overturned the previous dogma which suggested that vasculogenesis could only occur during embryogenesis. In fact, both vasculogenesis and angiogenesis may potentially have a synergistic role in postnatal revascularization. Also, this chapter summarized recent advances in EPC biology such as biological function, origin, definition, and classification. Each EPC culture and isolation method is clearly defined to prevent confusion in EPC biology. Section Two focuses on EPC biological function alteration in cardiovascular diseases (CVD). Several large clinical trials have reported that the number and biological function are strongly associated with major adverse cardiovascular events. The diagnostic and prognostic potential of EPC is crucial in terms of CVD. In Section Three, biological dysfunction mechanisms of EPC and their scarcity in diabetic patients' peripheral blood were clearly described. Preclinical studies have shown that EPC-based therapy is feasible, safe, and efficacious in multiple disease states. Subsequently, this has led to several clinical trials demonstrating the feasibility and safety profile of EPC therapy against cardiovascular ischemic diseases. In Section Four, regenerative medicine pioneers discussed EPCs translation to the clinic and cell transplantation challenges along with their solutions. Personalized stem cell-based therapy approaches

employing several clinical biomarkers, disease-related genetic-trait evaluation methods, and advanced analyses with state-of-the-art computational methods such as machine learning-based prediction can increase cell therapies' efficacy and decrease treatment costs. The last chapter in the book describes a therapeutic application of EPC-derived extracellular vesicles to cure CVD.

Teaching English Astrida Skrinda 2019 Original peer-reviewed contributions from recognized and established scholars and practitioners offer a variety of perspectives on teaching English as a second or foreign language and an expanded focus on teaching in international contexts. The authors challenge several current practices from multiple viewpoints and offer innovations that are thoughtful and engaging. Definitely, we must build on our past and present knowledge of what works to refine and improve existing language teaching practices and, it is hoped, develop other practices that will be even better and more encompassing. Thus, Chapter 1 reports the launch of a newly designed problem-based learning program in which metacognitive strategy instruction is integrated into an English listening curriculum. It combines the Problem-Based Learning Approach from education and the Metacognitive Approach from second-language listening research. The author does a good job at the end to try to disentangle the effects of the two treatments. This is an exciting time to be teaching English as a second or foreign language. In many countries, children are starting to learn English at an ever-younger age. Chapter 2 provides a meta-analysis of the situation currently observed in many English as a foreign language classes given to Polish and Slovak preschool learners, among others. It covers not only an analysis of a number of currently observed approaches, but also presents research-based propositions. Also, it suggests a handful of problem-grounded outcomes. We cannot be satisfied with the in-progress state of affairs but must seek out new ways to provide learners with the most effective and efficient language learning experiences possible, taking into account the learners' goals, interests, and learning contexts. Chapter 3 concerns the attitudes of Polish English-language majors to their target language cultural learning. Though Chapter 3 leaves us with many questions unanswered, it sheds the light on the teaching of cultural elements, particularly in a European context. Finally, Chapter 4 offers a unique perspective on language instruction, particularly for audiences unfamiliar with Buddhist philosophy. Basically, it describes a teaching approach based on Buddhist philosophy, which would probably be very effective for someone familiar and/or interested in that particular school of thought. Alternatively, it would open readers' mind to a completely different approach to language instruction, which may or may not work outside of its current context, but at least it has a very clear philosophical foundation and very clear set of procedures that are worth examining further. The intended audience are all those who are interested in teaching English as second or foreign language, including researchers, methodologists, curriculum and

materials designers, teachers, and undergraduate and graduate students.

Human Reproductive Physiology Rodney P. Shearman 1972

The Innate Immune System in Health and Disease: from the Lab Bench Work to Its Clinical Implications. Volume 2 Jorge Morales-Montor 2022-03-31 The aim of this book, The Innate Immune System in Health and Disease: From the Lab Bench Work to Its Clinical Implications. Volume 2, is to provide updated information to scientists and clinicians that is valuable in their quest to gather information, carry out new investigations, or to check on clinical implications of the innate immune system function during disease. This book is of high priority to people interested in an update on innate immunity. Volume 2 examines topics such as the participation of the innate immune system in homeostasis and in the pathogenesis of chronic inflammatory diseases, the innate immune response and its modulation by sex hormones during chronic lung inflammation, and asthma beyond adaptive immunity. Moreover, the role of TLRS during arthritis rheumatoid onset and development is discussed as well as the modulation of the innate immune system by extracellular vesicles. Furthermore, a novel strategy to interrupt the transmission of diseases by mosquitoes and the modulation of the innate immune system by the endocrine disrupting compounds bisphenol A (BPA) and phthalates are discussed. The Innate Immune System in Health and Disease: From the Lab Bench Work to its Clinical Implications. Volume 2 promises to be a must-have book for all people who want to know about the role of the basic functioning of the innate immune system in several diseases of actual relevance to human health.

Extracellular Vesicles Juanita F. Lafon 2020-01-29 Extracellular vesicles are small vesicles (or membrane-bound organelles) that can be found in blood and other biofluids and their internal content and surface reflect their origin and potential function. Extracellular Vesicles: Mechanisms and Role in Health and Disease begins with a summary of the most recent findings about the potential role of extracellular vesicles in human health and diseases and discusses future directions. The authors discuss how intercellular communication at the developing feto-maternal interface is of cardinal interest. The implantation itself is at least partially-dependent on extracellular vesicles' mediated processes. Furthermore, the altered local and systemic immunomodulatory state seems to be significantly influenced by proteomic and nucleic acid cargo found in extracellular vesicles. Lastly, recent studies in the development of metastatic potential are studied by focusing on the role of oxidative stress under the control of reprogrammed onco-metabolism using the LNCaP-C4-2B prostate cancer progression model system.