

Phagocytosis Of Dying Cells From Molecular Mechanisms To Human Diseases

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Cell Biology E-Book - Thomas D. Pollard 2007-04-26

A masterful introduction to the cell biology that you need to know! This critically acclaimed textbook offers you a modern and unique approach to the study of cell biology. It emphasizes that cellular structure, function, and dysfunction ultimately result from specific macromolecular interactions. You'll progress from an explanation of the "hardware" of molecules and cells to an understanding of how these structures function in the organism in both healthy and diseased states. The exquisite art program helps you to better visualize molecular structures. Covers essential concepts in a more efficient, reader-friendly manner than most other texts on this subject. Makes cell biology easier to understand by demonstrating how cellular structure, function, and dysfunction result from specific macromole-cular interactions. Progresses logically from an explanation of the "hardware" of molecules and cells to an understanding of how these structures function in the organism in both healthy and diseased states. Helps you to visualize molecular structures and functions with over 1500 remarkable full-color illustrations that present physical structures to scale. Explains how molecular and cellular

structures evolved in different organisms. Shows how molecular changes lead to the development of diseases through numerous Clinical Examples throughout. Includes STUDENT CONSULT access at no additional charge, enabling you to consult the textbook online, anywhere you go · perform quick searches · add your own notes and bookmarks · follow Integration Links to related bonus content from other STUDENT CONSULT titles—to help you see the connections between diverse disciplines · test your knowledge with multiple-choice review questions · and more! New keystone chapter on the origin and evolution of life on earth probably the best explanation of evolution for cell biologists available! Spectacular new artwork by gifted artist Graham Johnson of the Scripps Research Institute in San Diego. 200 new and 500 revised figures bring his keen insight to Cell Biology illustration and further aid the reader's understanding. New chapters and sections on the most dynamic areas of cell biology - Organelles and membrane traffic by Jennifer Lippincott-Schwartz; RNA processing (including RNAi) by David Tollervey., updates on stem cells and DNA Repair. ,More readable than ever. Improved organization and an accessible new design increase the

focus on understanding concepts and mechanisms. New guide to figures featuring specific organisms and specialized cells paired with a list of all of the figures showing these organisms. Permits easy review of cellular and molecular mechanisms. New glossary with one-stop definitions of over 1000 of the most important terms in cell biology.

Molecular Mechanisms of Programmed Cell Death - Yufang Shi
2013-06-29

The 2002 Nobel Prize in Physiology or Medicine was awarded to Sydney Brenner, H. Robert Horvitz, and John E. Sulston for their seminal discoveries concerning "genetic regulation of organ development and programmed cell death." This clearly marked the prime importance of understanding the molecular mechanisms controlling cell death. The 1st International Symposium on Programmed Cell Death was held in the Shanghai Science Center of the Chinese Academy of Sciences on September 8-12, 1996. A number of key issues in apoptosis were discussed at the meeting, and progress in major areas of apoptosis research was summarized by expert participants at the meeting and published by Plenum Publishing Corporation as a book entitled Programmed Cell Death. In the last six years, we have witnessed a real explosion in our knowledge on how cells undergo apoptosis, thereby participating in various developmental and pathophysiological processes. At this ever exciting time, we organized the 2nd International Symposium on Programmed Cell Death.

Cellular Aging and Cell Death - Nikki J. Holbrook 1995-12-20
Cellular AGING AND CELL DEATH Edited by Nikki J. Holbrook, George R. Martin, and Richard A. Lockshin Cellular Aging and Cell Death provides a thorough understanding of the mechanisms responsible for cellular aging, covering the recent research on programmed cell death and senescence, and describing their role in the control of cell proliferation and the aging process. This one-of-a-kind book is the first to combine the two hottest research areas of cell biology into one comprehensive text. Leading experts contribute to give readers an authoritative overview of the distinct fields of cellular aging and programmed cell death, as well as to demonstrate how both fields are

critical to understanding the aging process. They address the large and growing interest in apoptosis, especially with regard to the molecular signals that induce and regulate programmed cell death, and the role of apoptosis in a variety of age-associated diseases and disabilities. Throughout the book, a strong emphasis is placed on the interrelationship of the molecular, cellular, and physiological aspects of senescence. Individual chapters discuss such topics as the role and regulation of apoptosis in development, the potential impact of cell death on such postmitotic tissues as nerve and muscle, and suggest that programmed cell death plays an important role in both pathological and nonpathological aspects of aging, including neurodegenerative diseases. One important chapter focuses on the most recent research involving the study of telomeres, whose reduction in length with age and cell division may underlie cellular senescence. The subject of neuronal cell death is also put into the perspective of aging. Cellular Aging and Cell Death bridges the rapidly growing fields of cellular aging and programmed cell death. This thorough, yet concise book will be of particular interest to graduate students and researchers within the fields of cell and developmental biology, neurobiology, immunology, and physiology. Physicians and medical students involved in the fields of gerontology and pathology will also find this an informative reference.

Cellular and molecular mechanisms of motor neuron death in amyotrophic lateral sclerosis - Ricardo Tapia 2015-02-11

Amyotrophic lateral sclerosis (ALS), which was described since 1869 by Jean Martin Charcot, is a devastating neurodegenerative disease characterized by the selective and progressive loss of upper and lower motor neurons of the cerebral cortex, brainstem and the spinal cord. The cognitive process is not affected and is not merely the result of aging because it may occur at young ages. The only known cause of the disease is associated with genetic mutations, mainly in the gene encoding superoxide dismutase 1 (familial ALS), whereas there is no known cause of the sporadic form of ALS (SALS), which comprises >90% of cases. Both ALS types develop similar histopathological and clinical characteristics, and there is no treatment or prevention of the disease.

Because effective treatments for ALS, as for other neurodegenerative diseases, can only result from the knowledge of their cellular and molecular pathophysiological mechanisms, research on such mechanisms is essential. Although progress in neurochemical, physiological and clinical investigations in the last decades has identified several mechanisms that seem to be involved in the cell death process, such as glutamate-mediated excitotoxicity, alterations of inhibitory circuits, inflammatory events, axonal transport deficits, oxidative stress, mitochondrial dysfunction and energy failure, the understanding of the origin and temporal progress of the disease is still incomplete and insufficient. Clearly, there is a need of further experimental models and approaches to discern the importance of such mechanisms and to discover the factors that determine the selective death of motor neurons characteristic of ALS, in contrast to other neurodegenerative diseases such as Parkinson's and Alzheimer's disease. Whereas studies in vitro in cell cultures, tissue slices or organotypic preparations can give useful information regarding cellular and molecular mechanisms, the experiments in living animal models obviously reflect more closely the situation in the human disease, provided that the symptoms and their development during time mimics as close as possible those of the human disease. It is necessary to correlate the experimental findings in vitro with those in vivo, as well as those obtained in genetic models with those in non-genetic models, aiming at designing and testing therapeutic strategies based on the results obtained.

Autophagy: Cancer, Other Pathologies, Inflammation, Immunity, Infection, and Aging - M. A. Hayat 2013-07-29

Understanding the importance and necessity of the role of autophagy in health and disease is vital for the studies of cancer, aging, neurodegeneration, immunology, and infectious diseases. Comprehensive and forward thinking, these books offer a valuable guide to both cellular processes while inciting researchers to explore their potentially important connections. Considering that autophagy is associated with numerous biological processes, including cellular development and differentiation, cancer (both antitumor and protumor functions),

immunity, infectious diseases, inflammation, maintenance of homeostasis, response to cellular stress, and degenerative diseases such as Alzheimer's, Parkinson's, Huntington's, amyotrophic lateral sclerosis, and prion diseases, there is a great need to understanding its role. Cell homeostasis is achieved by balancing biosynthesis and cellular turnover. In spite of the increasing importance of autophagy in various pathophysiological situations (conditions) mentioned above, this process remains underestimated and overlooked. As a consequence, its role in the initiation, stability, maintenance, and progression of these and other diseases (e.g., autoimmune disease) remains poorly understood. Volumes in the Series

International Review of Cytology - 2000-11-08

International Review of Cytology presents current advances and comprehensive reviews in cell biology-both plant and animal. Articles address structure and control of gene expression, nucleocytoplasmic interactions, control of cell development and differentiation, and cell transformation and growth. Authored by some of the foremost scientists in the field, each volume provides up-to-date information and directions for future research. How the Assembly Dynamics of the Nematode Major Sperm Protein Generate Amoeboid Cell Motility Functional Specificity of Actin Isoforms Cell Biology of Cardiac Development Role of Programmed Cell Death in Development Reversible Vacuolation of T-Tubules in Skeletal Muscle: Mechanisms and Implications for Cell Biology *Sesquiterpene Lactones* - Valeria Patricia Sülsen 2018-06-07

This book addresses chemical and biological aspects related to sesquiterpene lactones (STLs). Experts in different fields have been invited to contribute on this class of compound's chemistry, isolation and identification, biological activities (antibacterial, antifungal, antiviral, antitrypanosomal, antileishmanial, antiplasmodial, antiproliferative and antiinflammatory), synthesis, biosynthesis, derivatization and QSAR analysis. Taxonomic and chemotaxonomic aspects related to the Asteraceae family are also contributed. The book begins by describing the chemical characteristics of STLs, their classification in different skeleton types, synthesis, distribution in nature and their most important

biological properties. An overview of the group's main representatives, based on their importance for human health, as well as an update of the most recently isolated STLs, follow. The authors also provide an overview of the most common methods described in the literature for the extraction, purification, identification and structure elucidation of STLs, while also highlighting more recently developed methods. Furthermore, experts in the field provide an in-depth discussion of the most commonly employed in vitro and in vivo antiprotozoal assays against the different stages of parasites, as well as STLs' properties as anticancer agents in numerous cancer cell lines and animal models. Lastly, the book presents examples of the in vitro and in vivo activity of STLs and their mechanism of antiprotozoal action, together with an analysis of ultrastructural alterations, observed using TEM techniques. The book is aimed at scientists working on natural products: both those investigating this particular group of compounds and those who wish to further explore its potential as new drugs for medical conditions such as protozoal diseases and cancer.

Autophagy in Infection and Immunity - Beth Levine 2009-10-03

Autophagy is a fundamental biological process that enables cells to autodigest their own cytosol during starvation and other forms of stress. It has a growing spectrum of acknowledged roles in immunity, aging, development, neurodegeneration, and cancer biology. An immunological role of autophagy was first recognized with the discovery of autophagy's ability to sanitize the cellular interior by killing intracellular microbes. Since then, the repertoire of autophagy's roles in immunity has been vastly expanded to include a diverse but interconnected portfolio of regulatory and effector functions. Autophagy is an effector of Th1/Th2 polarization; it fuels MHC II presentation of cytosolic (self and microbial) antigens; it shapes central tolerance; it affects B and T cell homeostasis; it acts both as an effector and a regulator of Toll-like receptor and other innate immunity receptor signaling; and it may help ward off chronic inflammatory disease in humans. With such a multitude of innate and adaptive immunity functions, the study of autophagy in immunity is one of the most rapidly growing fields of contemporary immunological

research. This book introduces the reader to the fundamentals of autophagy, guides a novice and the well-informed reader alike through different immunological aspects of autophagy as well as the countermeasures used by highly adapted pathogens to fight autophagy, and provides the expert with the latest, up-to-date information on the specifics of the leading edge of autophagy research in infection and immunity.

Non-Canonical Autophagy - Giulia Petroni 2021-05-01

Non-canonical Autophagy: Mechanisms and Pathophysiological Implications outlines the differences between 'canonical' and 'non-canonical' forms of autophagy, highlighting the discoveries concerning the molecular mechanisms underlying these unconventional forms of autophagy and the advancements in pathophysiological features of 'non-canonical' autophagy. The book discusses all forms of 'non-canonical' autophagy and the complexity of autophagy-dependent cell death. Readers will gain a better understanding of mechanisms underlying 'non-canonical' autophagy so that they can interpret the biological effects of autophagy correctly and identify reliable, novel and effective treatment strategies. Presents the most advanced information surrounding the molecular mechanisms underlying non-canonical autophagy Outlines the increasing evidence regarding the involvement of non-canonical autophagy in multiple physiological and pathological processes Discusses the therapeutic potential of autophagy modulators and the obstacles that have limited their development

Apoptotic and Non-apoptotic Cell Death - Shigekazu Nagata 2017-04-07

This volume focuses on apoptotic and non-apoptotic programmed cell death, including necroptosis, pyroptosis, and ferroptosis, and presents recent findings in the field. It discusses the crucial role that apoptotic and non-apoptotic cell death play in various pathological conditions, such as skin diseases, inflammatory bowel diseases, and virus infections. Further, it highlights the mechanisms underlying the recognition and clearance of dead cells, and the subsequent biological responses triggered by phagocytosed macrophages and factors released from dying cells. Offering insights into cell death, it is a valuable resource for

researchers and clinicians developing novel strategies to treat various diseases that are closely associated with cell death.

Molecular Biology of the Cell - Bruce Alberts 2004

Apoptosis and Autoimmunity - Joachim R. Kalden 2006-03-06

This is the first comprehensive book about the relationship between apoptosis and autoimmune diseases. It offers a unique up-to-date overview on research results on the defective execution of apoptosis and the incomplete clearance of apoptotic cells. The molecular and cellular mechanisms involved are described in detail. As a possible consequence of apoptotic dysfunction, the development of severe autoimmune diseases (e.g., rheumatoid arthritis, systemic lupus erythematosus) is discussed. An outlook on future research topics includes the evaluation of novel therapeutic strategies.

Inflammatory Tumor Immune Microenvironment: Molecular Mechanisms and Signaling Pathways in Cancer Progression and Metastasis - Xu Wang 2022-03-25

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.

Neuroglia Molecular Mechanisms in Psychiatric Disorders - Caterina Scuderi 2019-01-21

Neuropsychiatric disorders have long been considered as specific dysfunctions of neuronal functions. Studies of the recent decade, however, have challenged this simplistic view, highlighting the important role played by neuroglial cells in the onset and/or progression of neuropsychiatric diseases. In the central nervous system (CNS) non-excitable neuroglia are represented by cells of ectodermal origin (astrocytes, mainly responsible for CNS homeostasis and oligodendrocytes that provide myelination and support for axons) and mesodermal origin (microglial cells that are scions of foetal macrophages

entering the neural tube early in development; these cells provide for CNS defence and contribute to shaping neuronal networks). Pathological changes of neuroglia are complex; these changes are classified into reactive gliosis (astrogliosis, activation of microglia and hypertrophy of oligodendroglial precursors), gliodegeneration with loss of function and glial pathological remodelling. Combination of these processes defines the evolution of neurological diseases in general and neuropsychiatric disorders in particular. In this research topic we addressed the contribution of neuroglia to major neuropsychiatric pathologies including major depression, schizophrenia, and addictive disorders.

Cellular and Molecular Toxicology of Nanoparticles - Quaiser Saquib 2018-02-16

This edited book is a compilation of findings on the molecular and cellular toxicity of nanoparticles (NPs) in animal cell, human cells, invertebrates. The varied selection of test models will provide better understanding about the horizon of NPs toxicity. Interaction of NPs with cells and its organelles can induce toxicological consequences, including transcriptional and translational alterations, DNA damage, cytotoxicity, oxidative stress, mitochondrial dysfunction and cell death. NPs can get internalized in cells through phagocytosis, macropinocytosis, receptor-mediated endocytosis and passive penetration, which can affect varied cell types. Readers will be benefited with the compilations on basic and molecular facet of NPs toxicity. The chapters will provide a comprehensive information on the state-of-the-art methodologies. The application of toxicogenomic approaches, which is already established in nanotoxicology, has been given special consideration to unravel the toxicodynamics of nanomaterials. Among these approaches, the high-throughput RNA sequencing (RNA-Seq), which is able to build a complete map of transcriptome across different cell types and perturbations upon NPs exposure has been included. The readers are also introduced to the less studied topic on the adsorption of biomolecules (mainly proteins) on the NPs surface, constituting the so-called "biomolecular corona". The book has been designed for scientists engaged in NPs toxicity research. Nonetheless, it should be of interest to

a variety of scientific disciplines including marine biology, environmental pollution, genetics, pharmacology, medicine, drug and food material sciences, consumer products. Also, the compilations will be of interest to the environmental watchdogs, federal regulators, risk assessors and the policy makers.

Apoptosis in Cancer Pathogenesis and Anti-cancer Therapy -

Christopher D. Gregory 2016-08-24

This book discusses properties of apoptosis and other cell death modalities in cancer pathogenesis and treatment. Its nine chapters discuss modulation of anti-tumor inflammatory and immune responses, effects on the tumor microenvironment, to strategies for improving proapoptotic therapies, mechanisms and implications for disease pathogenesis, axl and mer receptor tyrosine kinases, immunogenic apoptotic cell death and anti-cancer immunity and cancer cell death-inducing radiotherapy. This book places the onco-biology of apoptosis in clear and objective perspective through an expertly synthesized series of reviews. Apoptosis in Cancer Pathogenesis and Anti-cancer Therapy is a deft and thorough exploration of cutting-edge research in apoptosis and anti-cancer mechanisms from basic biology to oncology. It highlights a rapidly growing field within cancer research and is essential reading for oncologists, biochemists and advanced graduate students alike.

Phagocytosis of Dying Cells - Dmitri V. Krysko 2014-09-12

Phagocytosis has been at the forefront of cell biology for more than a century. Initially, phagocytosis, which comes from Greek words meaning "devouring cells," was discovered in the late 19th century by Ilya Metchnikoff, who was awarded, together with Paul Ehrlich, the Nobel Prize in Physiology and Medicine in 1908 "in recognition of their work on immunity." At that time Metchnikoff had already identified a function for phagocytes not only in host defense but also as scavengers of degenerating host cells during metamorphosis of tadpoles, thus providing one of the first descriptions of apoptotic cell clearance by macrophages (Kaufmann 2008). Since then, much has been learned about phagocytosis, and the previous several decades have witnessed outstanding progress in understanding the functions and the molecular

mechanisms of phagocytosis. Two main types of targets are cleared by phagocytosis: microbial pathogens and dying cells. Rapid recognition and clearance of dying cells by phagocytes plays a pivotal role in development, maintenance of tissue homeostasis, control of immune responses, and resolution of inflammation. Clearance of dying cells can be divided into several stages, including sensing, recognition, binding and signaling, internalization, and immunological responses. In this book, our contributors address these different stages of dead cell clearance and examine how impaired clearance of dying cells may lead to human diseases. We have attempted to provide sufficient cross-referencing and indexing to enable the reader to easily locate the ideas elaborated in the different chapters.

Necrotic Cell Death - Han-Ming Shen 2016-08-23

Starting with discussion of basic concepts and the molecular mechanisms of necrosis, this book looks first at several forms of necrotic cell death that have been identified, including necroptosis, autophagic cell death, and PARP-mediated cell death. As necrotic cell death is increasingly known to play a critical role in many physiological processes, the next chapters discuss its effect on metabolism, inflammation, immunity, and development. Necrotic cell death is closely implicated in human diseases like cancer, so the next chapters examine its relevance to human diseases, and final chapters cover methodologies for measuring necrosis. This book presents comprehensive coverage of necrosis from recognized experts from leading academic and medical institutions around the world. In contrast to apoptosis, well-defined as a form of programmed cell death, necrosis used to be considered as accidental (i.e., non-programmed) cell death, usually in response to a severe injury. Accumulating evidence now suggests, however, that necrosis is also programmed and controlled by distinctive "death machinery" in response to various stimuli like oxidative stress or DNA damage.

The Mononuclear Phagocyte System in Infectious Disease -

Geanncarlo Lugo-Villarino 2019-10-04

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.

Fundamental Neuroscience - Larry Squire 2013

Fundamental Neuroscience, 3rd Edition introduces graduate and upper-level undergraduate students to the full range of contemporary neuroscience. Addressing instructor and student feedback on the previous edition, all of the chapters are rewritten to make this book more concise and student-friendly than ever before. Each chapter is once again heavily illustrated and provides clinical boxes describing experiments, disorders, and methodological approaches and concepts. A companion web site contains test questions, and an imagebank of the figures for ready use in presentations, slides, and handouts. Capturing the promise and excitement of this fast-moving field, *Fundamental Neuroscience*, 3rd Edition is the text that students will be able to reference throughout their neuroscience careers! New to this edition: * 30% new material including new chapters on Dendritic Development and Spine Morphogenesis, Chemical Senses, Cerebellum, Eye Movements, Circadian Timing, Sleep and Dreaming, and Consciousness * Companion website with figures, web links to additional material, and test questions * Additional text boxes describing key experiments, disorders, methods,

and concepts * Multiple model system coverage beyond rats, mice, and monkeys * Extensively expanded index for easier referencing

Current Topics in Developmental Biology - 2004-12-07

Current Topics in Developmental Biology provides a comprehensive survey of the major topics in the field of developmental biology. The volumes are valuable to researchers in animal and plant development, as well as to students and professionals who want an introduction to cellular and molecular mechanisms of development. The series has recently passed its 30-year mark, making it the longest-running forum for contemporary issues in developmental biology. This volume contains six important contributions from leading minds in developmental biology. * Presents major contemporary issues and astonishing discoveries at the forefront of modern developmental biology, stem cells, cloning, and regenerative medicine * Series Editor Gerald Schatten is one of the leading minds in reproductive and developmental science * The longest-running forum for current issues in developmental biology with over 30 years of coverage

Issues in Life Sciences: Cellular Biology: 2011 Edition - 2012-01-09

Issues in Life Sciences: Cellular Biology / 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Life Sciences—Cellular Biology. The editors have built Issues in Life Sciences: Cellular Biology: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Life Sciences—Cellular Biology in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Life Sciences: Cellular Biology: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Cytoskeleton - Jose C. Jimenez-Lopez 2017-05-17

The cytoskeleton is a highly dynamic intracellular platform constituted by a three-dimensional network of proteins responsible for key cellular roles as structure and shape, cell growth and development, and offering to the cell with "motility" that being the ability of the entire cell to move and for material to be moved within the cell in a regulated fashion (vesicle trafficking). The present edition of Cytoskeleton provides new insights into the structure-functional features, dynamics, and cytoskeleton's relationship to diseases. The authors' contribution in this book will be of substantial importance to a wide audience such as clinicians, researchers, educators, and students interested in getting updated knowledge about molecular basis of cytoskeleton, such as regulation of cell vital processes by actin-binding proteins as cell morphogenesis, motility, their implications in cell signaling, as well as strategies for clinical trial and alternative therapies based in multitargeting molecules to tackle diseases, that is, cancer.

Apoptotic Cell Clearance in Health and Disease - Estee Kurant 2018-12-27

Clearance of apoptotic cells is essential for proper development, homeostasis and termination of immune responses in multicellular organisms. Thus, cellular and molecular players taking part in the sequential events of this process are of great interest. Research in the last 20 years has indicated that specific ligands and receptors take part in the attraction of immune cells toward apoptotic targets and in the interactions between apoptotic cells and professional as well as non-professional phagocytes that engulf them. Moreover, phagocytosis of apoptotic cells (efferocytosis) leads to significant phenotypic changes in the engulfing cells suggesting that it is a major fate-determining event for phagocytes. Particularly, efferocytosis has an important impact on the inflammation-resolution axis as well as embryonic development and tissue morphogenesis. Deficiencies in these processes can result in health threats, such as autoimmunity, atherosclerosis, bone loss, obesity, infertility, neurodegeneration, fibrosis and cancer. This eBook brings together 24 original research and review manuscripts that cover various aspects of apoptotic cell removal during normal development and

homeostasis as well as in tumorigenesis and regenerative processes following injury.

Magnesium in the Central Nervous System - Robert Vink 2011

The brain is the most complex organ in our body. Indeed, it is perhaps the most complex structure we have ever encountered in nature. Both structurally and functionally, there are many peculiarities that differentiate the brain from all other organs. The brain is our connection to the world around us and by governing nervous system and higher function, any disturbance induces severe neurological and psychiatric disorders that can have a devastating effect on quality of life. Our understanding of the physiology and biochemistry of the brain has improved dramatically in the last two decades. In particular, the critical role of cations, including magnesium, has become evident, even if incompletely understood at a mechanistic level. The exact role and regulation of magnesium, in particular, remains elusive, largely because intracellular levels are so difficult to routinely quantify. Nonetheless, the importance of magnesium to normal central nervous system activity is self-evident given the complicated homeostatic mechanisms that maintain the concentration of this cation within strict limits essential for normal physiology and metabolism. There is also considerable accumulating evidence to suggest alterations to some brain functions in both normal and pathological conditions may be linked to alterations in local magnesium concentration. This book, containing chapters written by some of the foremost experts in the field of magnesium research, brings together the latest in experimental and clinical magnesium research as it relates to the central nervous system. It offers a complete and updated view of magnesium's involvement in central nervous system function and in so doing, brings together two main pillars of contemporary neuroscience research, namely providing an explanation for the molecular mechanisms involved in brain function, and emphasizing the connections between the molecular changes and behavior. It is the untiring efforts of those magnesium researchers who have dedicated their lives to unraveling the mysteries of magnesium's role in biological systems that has inspired the collation of this volume of

work.

The Innate Immune Response to Noninfectious Stressors - Massimo Amadori 2016-02-23

The Innate Immune Response to Non-infectious Stressors: Human and Animal Models highlights fundamental mechanisms of stress response and important findings on how the immune system is affected, and in turn affects such a response. In addition, this book covers the crucial link between stress response and energy metabolism, prompts a re-appraisal of some crucial issues, and helps to define research priorities in this fascinating, somehow elusive field of investigation. Provides insights into the fundamental homeostatic processes vis-à-vis stressors to help in investigation Illustrates the depicted tenets and how to offset them against established models of response to physical and psychotic stressors in both animals and humans Covers the crucial issue of the immune response to endocrine disruptors Includes immunological parameters as reporter system of environmental adaptation Provides many illustrative examples to foster reader understanding

Molecular Mechanisms of Phagocytosis - Carlos Rosales 2008-05-07

Although, Phagocytosis was first described nearly 120 year ago, we are just recently beginning to understand the molecules that phagocytic cells use to bring about this complex cell function. *Molecular Mechanisms of Phagocytosis* was prepared as a series of up-to-date essays (chapters) that describe the present knowledge on the various steps of the phagocytic process from initial cell contact, through internalization of the foreign particle, to the final phagosome formation where the phagocytosed particle is destroyed.

Apoptosis in Cancer Pathogenesis and Anti-cancer Therapy - Christopher D. Gregory 2018-04-22

This book discusses properties of apoptosis and other cell death modalities in cancer pathogenesis and treatment. Its nine chapters discuss modulation of anti-tumor inflammatory and immune responses, effects on the tumor microenvironment, to strategies for improving pro-apoptotic therapies, mechanisms and implications for disease pathogenesis, axl and mer receptor tyrosine kinases, immunogenic

apoptotic cell death and anti-cancer immunity and cancer cell death-inducing radiotherapy. This book places the onco-biology of apoptosis in clear and objective perspective through an expertly synthesized series of reviews. Apoptosis in Cancer Pathogenesis and Anti-cancer Therapy is a deft and thorough exploration of cutting-edge research in apoptosis and anti-cancer mechanisms from basic biology to oncology. It highlights a rapidly growing field within cancer research and is essential reading for oncologists, biochemists and advanced graduate students alike.

Mechanisms of Cell Death and Opportunities for Therapeutic Development - Diaqing Liao 2021-10-28

Mechanisms of Cell Death and Opportunities for Therapeutic Development, volume four in the Perspectives in Translational Cell Biology series, offers content for professors, students and researchers across basic and translational biology. The book covers fundamental mechanisms, ranging from different forms of cell death and drug development, to efforts for treating disease, providing a valuable resource for readers interested in understanding cell death and relevant translational research. The book's editor, Diaqing Liao, has over twenty years' experience teaching topics of cell death. Provides a comprehensive overview of current knowledge on the process of apoptosis, its potential role in health and disease, and a discussion of potential alternative forms, such as autophagy Covers fundamental mechanisms and relevant translational research

Phagocytosis of Dying Cells - Dmitri V. Krysko 2009-03-10

Phagocytosis has been at the forefront of cell biology for more than a century. Initially, phagocytosis, which comes from Greek words meaning "devouring cells," was discovered in the late 19th century by Ilya Metchnikoff, who was awarded, together with Paul Ehrlich, the Nobel Prize in Physiology and Medicine in 1908 "in recognition of their work on immunity." At that time Metchnikoff had already identified a function for phagocytes not only in host defense but also as scavengers of degenerating host cells during metamorphosis of tadpoles, thus providing one of the first descriptions of apoptotic cell clearance by macrophages (Kaufmann 2008). Since then, much has been learned

about phagocytosis, and the previous several decades have witnessed outstanding progress in understanding the functions and the molecular mechanisms of phagocytosis. Two main types of targets are cleared by phagocytosis: microbial pathogens and dying cells. Rapid recognition and clearance of dying cells by phagocytes plays a pivotal role in development, maintenance of tissue homeostasis, control of immune responses, and resolution of inflammation. Clearance of dying cells can be divided into several stages, including sensing, recognition, binding and signaling, internalization, and immunological responses. In this book, our contributors address these different stages of dead cell clearance and examine how impaired clearance of dying cells may lead to human diseases. We have attempted to provide sufficient cross-referencing and indexing to enable the reader to easily locate the ideas elaborated in the different chapters.

Phagocytosis: Molecular Mechanisms and Physiological Implications - Esther M. Lafuente 2020-12-03

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Mechanisms of Cell Death and Opportunities for Therapeutic Development - Diaqing Liao 2021-10-26

Mechanisms of Cell Death and Opportunities for Therapeutic Development, volume four in the Perspectives in Translational Cell Biology series, offers content for professors, students and researchers across basic and translational biology. The book covers fundamental mechanisms, ranging from different forms of cell death and drug development, to efforts for treating disease, providing a valuable resource for readers interested in understanding cell death and relevant

translational research. The book's editor, Diaqing Liao, has over twenty years' experience teaching topics of cell death. Provides a comprehensive overview of current knowledge on the process of apoptosis, its potential role in health and disease, and a discussion of potential alternative forms, such as autophagy. Covers fundamental mechanisms and relevant translational research.

Phagocytosis of Dying Cells - Dmitri V. Krysko 2009-01-14

Phagocytosis has been at the forefront of cell biology for more than a century. Initially, phagocytosis, which comes from Greek words meaning "devouring cells," was discovered in the late 19th century by Ilya Metchnikoff, who was awarded, together with Paul Ehrlich, the Nobel Prize in Physiology and Medicine in 1908 "in recognition of their work on immunity." At that time Metchnikoff had already identified a function for phagocytes not only in host defense but also as scavengers of degenerating host cells during metamorphosis of tadpoles, thus providing one of the first descriptions of apoptotic cell clearance by macrophages (Kaufmann 2008). Since then, much has been learned about phagocytosis, and the previous several decades have witnessed outstanding progress in understanding the functions and the molecular mechanisms of phagocytosis. Two main types of targets are cleared by phagocytosis: microbial pathogens and dying cells. Rapid recognition and clearance of dying cells by phagocytes plays a pivotal role in development, maintenance of tissue homeostasis, control of immune responses, and resolution of inflammation. Clearance of dying cells can be divided into several stages, including sensing, recognition, binding and signaling, internalization, and immunological responses. In this book, our contributors address these different stages of dead cell clearance and examine how impaired clearance of dying cells may lead to human diseases. We have attempted to provide sufficient cross-referencing and indexing to enable the reader to easily locate the ideas elaborated in the different chapters.

Apoptosis in Normal Development and Cancer - M Sluyser
2014-04-21

In apoptosis in the mammalian system, cells have a finite life - they

develop, are used and then die. Cancer cells escape this programmed routine but, from an understanding of apoptosis, they can be programmed to die. This book addresses the

Cell Death - Tobias Ntuli 2015-12-16

This book is a collection of selected and relevant research, concerning the developments within the Cell Death field of study. Each contribution comes as a separate chapter complete in itself but directly related to the book's topics and objectives. The target audience comprises scholars and specialists in the field.

Apoptosis: Mechanisms and Role in Disease - Sharad Kumar
2013-11-11

Mechanisms of Cell Death - Cell Death Society 1999

As the body of research on apoptosis grows, it paradoxically becomes simpler as the principles that define the field become more flexible and inclusive. Discussions of the role of cell death in AIDS, inflammatory disease, lung and cardiac disease, and lupus each emphasize the importance of understanding and regulating inflammation and the production of apoptotic bodies. Included in these proceedings is an in-depth review of the role of death cell genes, including intriguing studies of the existence of inhibitors of apoptosis in embryos. Many of these researchers now feel it is a combination, rather than any single gene, that activates apoptosis.

Apoptosis and Its Modulation by Drugs - Ross G. Cameron 2012-12-06

Apoptosis is a fascinating concept for the basic scientist. This is not only because of the multifaceted variety of proposed and discovered mechanisms, but because apoptosis represents a fundamental pathway for cell renewal. The study of apoptosis has resulted in an array of discoveries on signal transduction and downstream effects that have facilitated and advanced many fields in biology, including research on cancer and other diseases. Thus, the apoptotic process can be viewed as the largest effort of the scientific community to understand how cells work and tissues assemble or remodel. The most direct consequence of this accumulated knowledge is a greater understanding of disease and

pathological mechanisms. The end result of these efforts will be significant contributions to health and the adoption of new, never anticipated, therapeutic approaches. This book represents the summation of considerable effort from a significant group of contributors from all over the world as well as from its editors. In this fashion, many viewpoints have been collected and SUBjected to thorough academic discussion. The concepts contained in this medically important volume will stimulate and renew the ideas of scientists and indeed, will generate additional work to advance biological knowledge even further. The emphasis of this volume cements what has been established, adds what has not been explored fully, and creates a fertile ground for further hypotheses that will lead to a more complete understanding of the apoptotic process.

Cell Death - Douglas R. Green 2018-09-30

One million cells in our bodies die every second--they commit suicide by a mechanism known as apoptosis. Apoptosis is essential for survival of the body as a whole and has critical roles in various developmental processes and the immune system. In Cell Death, Douglas Green provides a clear and comprehensive view of apoptosis and other cell

death mechanisms. Taking a bottom-up approach, he starts with the enzymes that perform the execution process (a family of proteases termed caspases) and examines their cellular targets and the ways in which they are activated. He then looks at the molecular machinery that links signals that cause cell death to caspases, emphasizing the importance of the BCL-2 family of proteins and the role of cytochrome c released from mitochondria. The final stage of the process, phagocytic removal of dead or dying cells, is also covered. Green outlines the roles of apoptosis and death mechanisms such as necrosis in embryogenesis, neuronal selection, and the development of self-tolerance in the immune system. In addition, he explains how cell death defends the body against cancer and traces the evolutionary origins of the apoptosis machinery back over a billion years. This new edition contains critical new information on recent exciting advances in the field, such as new forms for cell death and important insights into the mechanisms and control of apoptosis. The book is thus of great use to all biologists interested in how cells function in the context of multicellular organisms and will appeal to everyone from undergraduates encountering the topic for the first time to researchers actively working in the field.