

GENETIC ABERRANCIES AND NEURODEGENERATIVE DISORDERS

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Genetic Aberrancies And Neurodegenerative Disorders Advances In Cell Aging And Gerontology

Paul Mark Mattson



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Genetic Aberrancies and Neurodegenerative

Disorders M.P. Mattson,2000-01-28 Genetic Aberrancies and Neurodegenerative Disorders presents critical reviews and emerging findings concerning the roles of genetic mutations and polymorphisms in the pathogenesis of a range of neurological disorders including Alzheimer s and Parkinson s diseases trinucleotide repeat disorders stroke epilepsy and others This volume written by leading experts brings together fundamental information concerning the roles of inherited traits in the pathogenesis of different neurodegenerative disorders In addition to providing a catalogue of the known genetic alterations that are linked to specific neurodegenerative disorders the chapters detail the current state of understanding of the cellular and biochemical mechanisms whereby the genetic aberrancies lead to neuronal dysfunction and degeneration The emerging picture of each disorder painted by pathological biochemical and molecular brushes suggests that they share key mechanisms including increased levels of oxidative stress perturbed ion homeostasis mitochondrial dysfunction and apoptotic proteolytic cascades The existence of specific molecular defects provides the opportunity to design experiments that can establish the precise pathogenic mechanism of a specific mutation or genetic risk factor The value of this approach is exemplified by recent studies of how mutations in Cu Zn superoxide dismutase cause amyotrophic lateral sclerosis and how presenilin mutations result in early onset Alzheimer s disease A theme developed among the different chapters is that events that occur during aging predispose neurons to genetic aberrancies that promote degenerative cascades and that specific genetic defects exert their influence on particular populations of neurons in a disorder specific manner The chapters in this volume will stimulate readers to generate new hypotheses concerning the pathogenic mechanisms of genetic aberrancies that can be experimentally tested

Genetic Aberrancies and Neurodegenerative Disorders M.P. Mattson,2000-02-11

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Clinical Neurology of Aging Martin L. Albert, Janice E. Knoefel, 2011-03-03 This clinically focused book is designed to help clinicians help older persons maintain that joy. Now divided into 9 comprehensive sections, this edition contains subjects ranging from geriatric assessment to pain management and palliative care.

Clinical Neurology of Aging Martin Albert, MD, PhD, FAAN, Janice Knoefel, MD, MPH, 2011-01-11 Aging does not automatically imply decline. Many older people find joy in their friendships and their willingness to look at the world with a calmer view than they may have had in youth. This book clinically focused is designed to help clinicians help older persons maintain that joy.

Recent Advances in Psychology and Aging P. Costa, I.C. Siegler, 2003-12-10 Recent Events in the Psychology of Aging documents the successful integration of aging into the mainstream of psychology. Leading psychologists present overviews of the key issues and research findings on mainstream topics. These include cognitive neuroscience, visual attention, learning, memory, and cognition, as well as personality and happiness. The intersection of aging content with mainstream psychology is also prominent in the areas of emotions, personality, and social psychology, as seen in the chapters on subjective well-being, emotional development, self-esteem, and personality trajectories. The seven chapters of this book offer information on such topics as the seven sins of memory, categorizing the common breakdowns of memory in everyday life, and the special breakdown of sins that increase with aging, problems with attention and learning, and offers answers to questions such as: do emotions get blunted with age? do older people focus more on positive feelings? and the age-old question of whether older people are happier than younger people is given in the chapter on the evolving concept of subjective well-being and the multifaceted nature of happiness. Questions about what occurs to one's self-esteem and personality are also masterfully discussed, and the answers may be surprising. The concluding seventh chapter provides a cultural lens on the biopsychosocial study of aging.

Stem Cells: A Cellular Fountain of Youth M.P. Mattson, G. van Zant, 2002-08-21 The developmental capabilities and therapeutic potential of stem cells are being revealed in studies of cellular signaling mechanisms that regulate their proliferation, differentiation, and survival. Stem Cells: A Cellular Fountain of Youth reviews the current state of understanding of the molecular mechanisms that regulate embryonic and adult stem cells, with an emphasis on how aging and age-related disease impact on these mechanisms. Leading authorities detail the properties and therapeutic potential of embryonic stem cells and stem cell precursors of blood, nervous, and muscle and bone cells. Recent advances in deciphering the environmental signals and intrinsic signal transduction pathways that regulate embryonic stem cells are described, and the potential therapeutic uses of

these totipotent cells is considered. Analyses of hematopoietic stem cells during aging suggest an important genetic component to the control of their self-renewing capability which may contribute to determination of lifespan. The contribution of lymphocyte depletion to impaired immune function during aging is considered as is the potential of hematopoietic cells to form other types of cells including neurons. Several chapters cover the remarkable and rapidly advancing field of neural stem cells. The adult brain contains populations of stem cells capable of forming new neurons and glial cells; the signals that regulate these neural stem cells and the involvement of neurogenesis in normal brain function is described. Because of their potential to replace lost or damaged neurons, there has been intense interest in determining the therapeutic potential of stem cells for the treatment of patients with Parkinson's and Alzheimer's diseases, stroke, and traumatic brain and spinal cord injuries. Heart and skeletal muscle contain stem cells, and the impact of aging and disease on these stem cell populations and the potential of stem cell therapy to recover function of these organs is reviewed. A final example of the fascinating world of stem cells is a review of the roles of stem cells in bone formation and remodeling. Collectively, this book provides a comprehensive yet concise view of stem cell molecular biology in the context of aging and age-related disease. This book will be a valuable reference for graduate students and senior scientists interested in the fascinating world of stem cells and their potential use in the clinic.

Neuropathology and Genetics of Dementia Markus Tolnay, Alphonse Probst, 2001-05-31. This volume is the proceedings from the Swiss Society for Neuropathology XVIIIth International Winter Meeting held March 23-26, 2000 in St. Moritz, Switzerland. For more than 35 years, the Swiss Society of Neuropathology has organized its traditional International Winter Meeting, whose main aim is to bring together neuropathologists and clinicians as well as neuroscientists interested in disease mechanisms. The topic of the 2000 Meeting was Neuropathology and Genetics of Dementia. A programme of invited plenary lectures of high educational value as well as platform and poster presentations given by many participants covered the broad spectrum of dementing disorders. Encouraged by the high standard of the meeting and probably also influenced by the advent of a new Millennium, it was decided to publish the Proceedings of the 2000 Meeting in the present book.

The Role of DNA Damage and Repair in Cell Aging B.A. Gilchrest, V.A. Bohr, 2001-03-09. Aging occurs at the level of individual cells; a complex interplay between intrinsic programming and exogenous wear and tear with genetically determined cellular capacity to repair environmentally induced DNA damage playing a central role in the rate of aging and its specific manifestations. In 12 chapters, *The Role of DNA Damage and Repair in Cell Aging* provides an intellectual framework for aging of mitotic and post-mitotic cells, describes a variety of model systems for further studies, and reviews current concepts of DNA responses and their relationship to the phenomenon of aging. As part of a series entitled *Advances in Cell Aging and Gerontology*, this volume also summarizes seminal recent discoveries such as the molecular basis for Werner syndrome, a mutant DNA helicase, the complementary roles of telomere shortening and telomerase activity in cell senescence versus immortalization, the role of apoptosis in the homeostasis of aging tissue, and the existence of an inducible SOS-like

response in mammalian cells that minimizes DNA damage from repeatedly encountered injurious environmental agents Insights into the relationship between cellular aging and age associated diseases particularly malignancies are also provided in several chapters This book is an excellent single source of information for anyone interested in DNA repair mechanisms of aging or certainly their intersection Students will gain a general appreciation of these fields but even the most senior investigators will benefit from the detailed coverage of rapidly advancing areas

Basic Biology and Clinical Impact of Immunosenescence G. Pawelec,2003-05-01 Ageing is of perennial interest as a universal feature in all human societies The genetic background and biochemical bases of ageing processes are currently being revealed in unprecedented detail It is emerging that one of the main hurdles to be overcome in achieving a long and healthy lifespan is the maintenance of a properly functioning immune system The main cause of death in people who have achieved successful ageing which mostly means not having succumbed to cancer or cardiovascular disease is infectious disease caused by immunosenescence This book contains chapters by many of the leaders in the field of immune related issues in ageing and remediation

Alzheimer's Disease Khalid Iqbal,Sangram S. Sisodia,Bengt Winblad,2003-01-24 Alzheimer s Disease is an ever present problem affecting millions of people around the world and as people s average lifespan lengthens its prevalence is set to increase A global effort is needed to combat the disease including research to investigate the causes development of effective treatments and ultimately prevention of the disease Published every two years these timely books discuss the very latest research This new volume provides a unique source of reference to the important work being done in this field it gives academics and clinicians an opportunity to learn about cutting edge developments and covers all aspects of Alzheimer s Disease including diagnosis clinical course epidemiological course and therapeutics and disease mechanisms Alzheimer s Disease Advances in Etiology Pathogenesis and Therapeutics will provide essential information for basic and clinical researchers in Alzheimer s Disease and other dementias as well as for those who care for patients

Sleep and Aging Mark P. Mattson,2005-06-20 The book describes the mechanisms involved in the maintenance of neuroendocrine immune interactions in ageing The lack of this maintenance leads to the appearance of age related diseases cancer infections dementia and subsequent disability The capacity of some hormones or nutritional factors in restoring and remodelling the neuroendocrine immune response during ageing is reported presenting possible new anti ageing strategies in order to reach healthy ageing and longevity

Neurodegeneration Dennis Dickson,Roy O. Weller,2011-11-07 Most textbooks on neurodegenerative disorders have used a classification scheme based upon either clinical syndromes or anatomical distribution of the pathology In contrast this book looks to the future and uses a classification based upon molecular mechanisms rather than clinical or anatomical boundaries Major advances in molecular genetics and the application of biochemical and immunocytochemical techniques to neurodegenerative disorders have generated this new approach Throughout most of the current volume diseases are clustered according to the proteins that accumulate within cells e g tau

synuclein and TDP 43 and in the extracellular compartments e g amyloid and prion proteins or according to a shared pathogenetic mechanism such as trinucleotide repeats that are a feature of specific genetic disorders Chapters throughout the book conform to a standard lay out for ease of access by the reader and are written by a panel of International Experts Since the first edition of this book major advances have been made in the discovery of common molecular mechanisms between many neurodegenerative diseases most notably in the frontotemporal lobar degenerations FTL and motor neuron disease or amyotrophic lateral sclerosis This book will be essential reading for clinicians neuropathologists and basic neuroscientists who require the firm up to date knowledge of mechanisms diagnostic pathology and genetics of Neurodegenerative diseases that is required for progress in therapy and management

Energy Metabolism and Lifespan Determination M.P. Mattson, 2003-12-01 Experts in the fields of energy metabolism aging and oxidative stress provide an integrated view of how mechanisms involved in regulating energy metabolism are linked to fundamental processes of aging including cellular stress resistance and free radical production During evolution signal transduction pathways and organ systems have been optimised for the efficient seeking ingestion storing and using of energy These signalling pathways play prominent roles in lifespan determination with insulin and related signalling pathways being prime examples The authors consider how lifespan and healthspan can be extended through knowledge of energy metabolism with the experimental model of dietary restriction being one example The information in this volume of ACAG will foster novel approaches and experiments for further understanding the roles of energy metabolism in aging and disease

Telomerase, Aging and Disease M.P. Mattson, 2001-10-12 This volume of Advances in Cell Aging and Gerontology critically reviews the rapidly advancing area of telomerase research with a focus at the molecular and cellular levels The clearly established function of telomerase is to maintain chromosome ends during successive rounds of cell division by adding a six base DNA repeat on to the telomeric ends of chromosomes As presented in the chapters of this volume the mechanisms that regulate telomerase expression and activity are complex Moreover emerging data suggest additional roles for telomerase in the regulation of cell differentiation and survival It is expected that this quite comprehensive volume will provide a valuable resource for graduate students and postdocs in the telomerase field and for established investigators in other fields who are beginning to study telomerase in their particular research program With an increasing number of proteins being brought into the fold of telomerase research e g DNA damage and repair response proteins heat shock proteins and proteins in various signal transduction cascades many new scientists are beginning to study this enzyme from novel vantage points

Human Prion Diseases, 2018-06-07 Human Prion Diseases Volume 153 is designed to update the reader on the latest advances and clinical aspects of prion diseases The book is organized into five sections including the pathophysiology of prions and a description of animal and human diseases This is followed by detailed reports on recent advances in diagnosis strategies for the development of novel anti prion molecules and possible designs of clinical trials in such a rare disease An introductory

chapter gives an extensive historical background of prion research with a final chapter highlighting recent progress and more importantly unsolved problems Offers an authoritative overview of prion diseases in humans detailing the pathogenesis of the disease clinical investigations and the diagnosis of both the genetic and acquired forms Provides clarity and context by presenting prion diseases in relation to other neurodegenerative diseases in humans Emphasizes the unique properties of prion diseases and consequent problems they can cause both clinically and in public health terms **Protein**

Phosphorylation in Aging and Age-Related Disease Paul Mark Mattson, 2004-02-17 It can be argued that ATP is the most important molecule in cells Not only is ATP the key energy source for cells but it is also the source of phosphate groups that are transferred to a variety of substrate proteins via the action of elaborate families of protein kinases An equally elaborate array of protein phosphatases can remove phosphate groups from proteins It is now well established that protein phosphorylation is a widely used mechanism for cells to selectively modulate the function of a variety of proteins including enzymes ion channels and pumps and structural proteins In this volume of ACAG leading experts describe the evidence that protein phosphorylation is altered in aging and age related disease Protein phosphorylation controls fundamental processes such as transcription and translation regulation of the cell cycle signalling within and between cells cell motility synaptic function and so on Recent findings are revealing how phosphorylation dependent signalling cascades may control lifespan with a prime example being the insulin signalling pathway first described in *C. elegans* and now emerging as an important regulator of lifespan of mammals also Many of the functional changes that occur during aging such as impaired learning and memory and altered energy metabolism are controlled by protein phosphorylation and it is therefore important to understand how mechanisms of protein phosphorylation may either mediate aging or provide adaptive responses that allow successful disease free aging The authors in addition to considering the roles of protein phosphorylation in aging describe the evidence that abnormalities in protein phosphorylation contribute to the pathogenesis of major age related diseases including diabetes atherosclerosis and neurodegenerative disorders such as Alzheimer's and Parkinson's diseases **Programmed Cell**

Death, Volume I S. Estus, V. Rangnekar, M.P. Mattson, 2001 Apoptosis or programmed cell death is an adaptive form of cell death that plays a critical role in turnover of mitotic cells and various tissues in the adult including epithelial cells fibroblasts and various endocrine cells Programmed cell death also plays a major role in development in organizing the body plan and molding intricate cellular structures such as nerve cell circuits in the brain Rapidly progressing research into the molecular and biochemical underpinnings of the programmed cell death process are revealing novel genetic programs and molecular interactions that coordinate a process that results in death and removal of cells without an immune response and in the absence of the adverse effects on neighboring cells Programmed Cell Death Volume I critically details the molecular biochemical and cellular mechanisms of apoptosis This volume covers programmed cell death in a variety of tissues and organ systems highlighting the interesting families of proteins involved in promoting or preventing apoptosis These include

the caspase and calpain families of proteases Bcl 2 family members and inhibitors of apoptosis proteins Each chapter is written by an internationally recognized expert in a particular aspect of programmed cell death This book will provide the reader with a comprehensive understanding of the cascade of events leading from an apoptotic signal such as trophic factor withdrawal or increased oxidative stress to cell death Importantly this volume also covers signaling mechanisms designed to prevent apoptosis Such anti apoptotic signaling cascades involve neurotrophic factors and stress response pathways

Programmed Cell Death Volume I provides the molecular and cellular foundation for <http://www.elsevier.com/locate/0444507302> Programmed Cell Death Volume II in which the roles of aberrant regulation of apoptosis in human diseases ranging from cancer to Alzheimer's disease are considered *Calcium Homeostasis and Signaling in Aging* M.P. Mattson, 2002-10 This volume of *Advances in Cell Aging and Gerontology* reviews the mechanisms that regulate cellular calcium homeostasis in various tissues throughout the body and how these systems change during aging Normal functions of calcium in regulating various physiological processes are considered and the evidence supporting roles for perturbed calcium regulation in the pathogenesis of several prominent age related disorders are detailed The cross disciplinary approach used to organize this book should provide readers interested in a specific area of calcium regulation with a broader perspective and a framework for which to shape future studies in their laboratories

Connective Tissue and Its Heritable Disorders Peter M. Royce, Beat Steinmann, 2003-04-14 The Second Edition of *Connective Tissue and Its Heritable Disorders: Molecular Genetic and Medical Aspects* is the definitive reference text in its field with over 40% more pages on the nature, diagnosis and treatment of disease than its predecessor Collecting new research on disorders detailed in the first edition as well as on those previously excluded editors Peter Royce and Beat Steinmann provide the most up to date clinical and scientific information for medical specialists treating affected individuals Features of this revised and updated volume include detailed reviews of the clinical diagnosis, mode of inheritance, risk of recurrence and prenatal diagnosis of each inherited connective tissue disorder a thorough description of the morphology of connective tissues a completely updated and revised section on the biology of the extracellular matrix and the addition of syndromes such as craniosynostosis and disorders of sulfate metabolism

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