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The Anatomy of Aging in Man and Animals
 Springer Science & Business Media
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Drugs and Aging Springer Science &
 Business Media

This book provides an overview of recent
 advances in the study of aging and aging
 related diseases, discussing the topics at
 individual, organ, tissue, cell, and
 molecular levels. It also presents studies
 on the biomarkers of aging and anti-aging
 interventions. Aging has been becoming a
 global health problem. However it was not
 possible to determine aging as we usually
 diagnose a disease because there are few
 biomarkers for age estimation. Since
 ancient times, people have been seeking
 anti-aging substances and methods for
 achieving immortality, while the scientific
 study of aging has only existed for 100
 years. This book appeals to researchers
 both in institutes and in pharmaceutical
 companies interested in further studies in
 this field.

Modulating Aging and Longevity CRC Press

After decades of systematic collection of
 data describing age-related changes in
 organisms, organs, tissues, cells and
 macromolecules, biogerontologists are
 now in a position to construct general
 principles of ageing and explore various
 possibilities of intervention using rational
 approaches. While not giving serious
 consideration to the claims made by
 charlatans, it cannot be ignored that
 several researchers are making genuine
 attempts to test and develop various
 means of intervention for the prevention
 and treatment of age-related diseases, for
 regaining the functional abilities and for
 prolonging the lifespan of experimental
 organisms. This book provides the most
 up-to-date information and a critical
 evaluation of a variety of approaches
 being tried for modulating aging and
 longevity, including dietary

supplementation with antioxidants, vitamins and hormones, genetic engineering, life-style alterations, and hormesis through mild stress. The goal of research on ageing is not to increase human longevity regardless of the consequences, but to increase active longevity free from disability and functional dependence.

Biology of Human Aging Oxford University Press

During the last 40 years, the study of the biological basis of aging has progressed tremendously, and it has now become an independent and respectable field of study and research. This volume on "Aging of Organs and Systems", is an attempt to bring understanding to both the aging process and the disease processes of old age. Bringing together contributions from an international team of authors, it will be of interest to graduates and postgraduates in the fields of medicine and nursing, researchers of different aspects of biogerontology and those in the pharmaceutical, cosmeceutical, nutraceutical and health-care industry. *The Aging Body* Modulating Aging and Longevity

This is a medical book about old age. It contains research, known facts of the time, information about medical intervention and dealing with death among other things. It was published first in 1922.

Problems of Ageing Frontiers

The objective of this book is to provide information that will be useful to people in a variety of disciplines who wish to learn more about normal aging processes in the human body. Although gerontologists in the biological sciences are making great strides in research on human aging and documenting this work in mono graphs, texts, and review chapters, this information is generally not easily accessible nor is it comprehensible to nonprofessionals in these fields. This book is intended to provide a summary of this work, along with its implications for psychological functioning of the aging individual. The majority of the book is devoted to describing the results of research on the physiological changes in the human body with aging and to seeking explanations for these age effects. This description has been approached in such a way as to make it readable for the nonspecialist, but also to focus on research issues that will be useful reading for those who are currently working in these particular areas. In addition, throughout the book, I have tried to develop some themes regarding physiological and psychological adaptation

during adulthood.

Our Future Selves Springer Science & Business Media

This book presents studies of the main conditions that affect health and well-being of old people. Considering the present scenario of COVID-19, the effects of this viral infection on individuals older than 65 years are also discussed. The content enables professionals of health and government for the present and future actions in this important area. Readers go through the changes occurring in organs and tissues that can interfere with susceptibility to infections, low response to vaccines, cancer, and loss of cognition during the aging process. A discussion of the central role played by the immune system in the age-related diseases and how the immunity can be impaired during the ageing process is presented.

Possibilities to circumvent these conditions via healthy habits in diet, physical exercise, and new pharmacological interventions are part of the content. This book discusses how human healthy longevity is dependent, at least in part, of a functional immune system. Chapters were written for researchers in the field of aging and is especially suited for those interested in the study of immunosenescence and inflammaging affecting the health of old individuals. Rutgers University Press

Year on year, countries across the world continue to see an increase in life expectancy, largely attributed to the impact of modern medicine and disease eradication. There is now increasing evidence that environmental factors such as diet and lifestyle also have a significant role to play. However with this increase in years there often comes an unfortunate rise in chronic morbidity, with the quality of later life severely compromised by ill health. With age being the single greatest risk factor for a large proportion of common medical conditions, this latest report from the British Nutrition Foundation looks in detail at the role nutrition and physical activity can play in ensuring that the older adults of tomorrow can lead not only longer, but healthier lives. Written by a team of well known and respected experts Describes the role of diet and lifestyle in the ageing process of the major body organs and tissues including the brain, heart, gastrointestinal tract, musculoskeletal tissues, eyes, teeth and skin, as well as immune and endocrine systems Provides essential information for anyone involved in promoting health and quality of life for older people Each chapter includes a summary of the key points, as well as important

recommendations to help identify long-term strategies for healthy ageing An overview of the main messages of the report are provided in a practical question and answer format suitable for lay readers Full of invaluable information on a subject which is set to increase in importance as the average age of populations rise worldwide, this book is crucial reading for students of nutrition, dietetics and food science, clinical nutritionists, public health nutritionists and policy makers. It will also provide an excellent reference for those working in the food industry and for nutritional supplement manufacturers and pharmaceutical companies.

How and why We Age John Wiley & Sons
Preeminent cell biologist Leonard Hayflick reveals the results of more than thirty years of pioneering research in the field of aging. Gracefully written, clearly organized, and packed with essential facts and statistics, "How and Why We Age" is a landmark study of the aging process for readers of all ages.

Cells, Aging, and Human Disease Frontiers Media SA

The world population presents an increased percentage of individuals over 65 years old and the fastest growing subgroup is over 85 years old. The increase in life expectancy observed in the last century has not been synonymous with extra years lived in good health (disability-free years). Population studies have shown that as individuals age, they can present a great heterogeneity of ability and health. Therefore, aging has been associated for some individuals with disabilities and hospitalizations. Deaths related to infectious pathogens are increased in the aging population mainly due to pneumonia and influenza whereas Cytomegalovirus, Epstein-Barr virus, among other viruses seem to contribute to the low-grade inflammatory process observed (inflammaging). Aging is a complex and multifactorial process in which functions of the organism are adjusted (remodelled) in order to deal with damaging events during life. One of the most important changes in aging individuals occurs in the immune system (innate and adaptive responses) with consequences such as poor response to new infections and vaccinations; increased susceptibility to cancer development and autoimmune diseases; frailty, and organ dysfunction. In addition, it has been proposed that immunosenescence not only reflects the aging of the organism but also contributes to this process. Bone marrow presents decreased hematopoiesis, the thymus undergoes involution and lymphoid organs (lymph

nodes, spleen) also present reduced functionality. Therefore, cells derived, matured, or residing in these tissues decline in number and function. These changes have been identified in experimental models, in vitro conditions, peripheral blood, and biopsies via biomarkers such as cell phenotype, stimulus-induced proliferation, cytokines and antibodies levels. Telomere length and telomerase activity also decline in bone marrow-derived and peripheral blood cells and have been shown to play a role in immunosenescence. More recently, the investigation of short non-coding RNA molecules (microRNAs; miRNAs) pointed to this system as a possible control of aging-related mechanisms. Data obtained on these markers for aging individuals could lead to the generation of a marker panel for pathology prediction, to indicate interventions, and to evaluate the efficacy of interventions. Interventions such as nutrition supplements, exercise, vaccination (different dose, concentration of antigen, adjuvants) have been proposed to circumvent age-related diseases. Considering the heterogeneity in the aging process, further investigation is vital before the indication of interventions for aging individuals. As the extension of life expectancy is a reality, it is a challenge to understand how the aging population copes with the remodelling of the organism and how interventions could provide longevity in good health.

The Process of Aging in the Nervous System Oxford University Press

Aging and its associated problems are of increasing interest and concern as the life expectancy of the human population increases. The importance of continued functioning of the nervous system in cognitive and integrative processes, necessary for maintaining the quality of life during aging, is self evident. The nature and extent of the changes that occur with increasing age differ considerably in different species and also in the various organs or tissues within a given species. emphasis on normal aging, as it applies to the nervous systems of man and other mammals, as well as to certain invertebrates. Changes in human brain function due to Alzheimer s disease are considered in addition to changes that may occur with normal human aging. The potential involvement of immunocytes in age-associated disorders is also discussed. nervous system, generally, due to aging, from molecular, pharmacological, electrophysiological and behavioral perspectives. This book emphasizes the attempts of recent research to understand the basic mechanisms for these changes,

as well as their functional consequences and provides important insight into our understanding of the aging process and the consequences of these changes for neuronal function. Topics considered include neuropeptides systems in aging, including opioids and analgesic, cholinergic and aminergic systems, neuroendocrinology and neuroimmunology.

Senescence, the Last Half of Life Springer

An animal's survival strongly depends on its ability to maintain homeostasis in response to the changing quality of its external and internal environments. This is achieved through intercellular communication not only within a single tissue but also among different tissues and organ systems. Thus, alterations in tissue-to-tissue or organ-to-organ communications, which are under genetic regulation, can affect organismal homeostasis, and consequently impact the aging process. One of the organ systems that play a major role in maintaining homeostasis is the nervous system. Considering that the nervous system includes the sensory system, which perceives the complexity of an animal's environment, it should be no surprise that there would be a sensory influence on homeostasis and aging. To promote homeostasis, any given sensory information is transmitted through short-range signals via neural circuits and/or through long-range endocrine signals to target tissues, which may in turn be neuronal or non-neuronal in nature. At the same time, since homeostasis involves a number of feedback mechanisms, non-neuronal tissues can also modulate sensory and other neuronal functions. Several genes that regulate signaling pathways known to affect homeostasis and aging have been shown to act in neurons, in tissues that are likely downstream targets of the nervous system, or through feedback regulation of neuronal activities. These genes can have different temporal requirements: some might function early, e.g., by affecting neural development, while others may only be required later in adulthood. Some well-known examples of genes involved in the neuronal regulation of homeostasis and longevity encode components of the evolutionarily conserved nutrient-sensing insulin/insulin-like signaling pathway, the stress-sensing internal repair system, and the mitochondrial electron transport chain. Indeed, the genetic perturbation of these pathways has been found to lead to numerous diseases, many of which are age-related and involve the nervous

system, such as neurodegeneration and the metabolic syndrome. Despite much progress, however, many aspects of the neuronal inputs and outputs that affect aging and longevity are poorly understood to date. For example, the precise neuronal and non-neuronal circuitries and the details of the molecular mechanisms through which genes/signaling pathways maintain homeostasis and affect aging in response to the environment remain to be elucidated. Similarly, it is presently unclear whether genes that regulate the early development of the nervous system and its consequent circuitry influence homeostasis and longevity during adulthood. At the same time, although many genes affecting aging are conserved, both the nervous system and the aging process are highly variable within populations and among taxa. Accordingly, the role of natural genetic variation in shaping the neurobiology of aging is also presently unknown. The aim of this Research Topic is therefore to highlight the genetic, developmental, and physiological aspects of the signaling networks that mediate the neuronal inputs and outputs that are required to maintain organismal homeostasis. The elucidation of the effects of these neuronal activities on homeostasis may thus provide much-needed insight into mechanisms that affect aging and longevity.

No More Dying Pergamon
Modulating Aging and LongevitySpringer
Science & Business Media
Aging and Cell Structure Benjamin-Cummings Publishing Company

Extracellular matrix (ECM) is a dynamic scaffold that provides both structural support and functional integrity to various tissues and organs. By serving as a natural reservoir to a variety of resident cells, ECM actively interacts with these residing cells and regulates their behaviors ranging from differentiation and proliferation to migration and regeneration. Due to its dynamic nature, ECM constantly undergoes remodeling as the local tissues experience either physiological or pathological changes, such as aging and fibrosis. Therefore, understanding the changes occur in ECM may help the development of clinically translated stem cell applications for conditions like aging and fibrosis. In this thesis, we examine the changes that ECM undergoes with aging and pathogenesis by using two different organ systems, skeletal muscles and skin. Specifically, in the first study, we determine the biochemical changes of ECM in muscles of both wild type and dystrophic mice at various ages. We also demonstrate the structural changes of

ECM associated with aging and muscle pathology. In the second study, we establish a decellularized skin model to study the effect of extracellular matrix on fibroblast behavior in an effort to understand the role of ECM on fibrosis progression. Our results show that aging and disease have a tremendous effect on biochemical composition of ECM in skeletal muscles. Also, we demonstrate that the decellularized skin model has the potential of studying the role of ECM properties on skin fibrosis, and decellularized tissue has an effect on activation of fibroblasts.

Man Against Mortality Springer Science & Business Media

The life of a human being is finite, and all humans age (see Fries 1980). It is difficult to separate the effects of disease on organs and tissues from those expected of aging. This is particularly true for vascular and degenerative processes, for which there are no clear boundaries between aging and disease. Morbidity and mortality from heart disease and stroke are probably due both to disease and to changes of aging. For cancer, the second leading cause of death in America, the situation is quite different; cancer is clearly a disease and is not a change expected with aging. Cancer incidence increases almost logarithmically after age 40. In the United States about one-half of all cases of cancer are diagnosed after age 65, although those over 65 comprise less than one-eighth of the population. Thus, cancer is very much a disease of the elderly. There are at least two reasons for this: first, the prolonged exposure to cancer-inducing agents, and second, the waning power of immune defenses against cancer.

Aging of the Organs and Systems CRC Press

Cells, Aging, and Human Disease is the first book to explore aging all the way from genes to clinical application, analyzing the fundamental cellular changes which underlie human age-related disease. With over 4,000 references, this text explores both the fundamental processes of human aging and the tissue-by-tissue pathology, detailing both breaking research and current state-of-the-art clinical interventions in aging and age-related disease. Far from merely sharing a common onset late in the lifespan, age-related diseases are linked by fundamental common characteristics at the genetic and cellular levels. Emphasizing human cell mechanisms, the first section presents and analyzes our current knowledge of telomere biology and cell senescence. In superb academic detail, the text brings the reader up to

date on telomere maintenance, telomerase dynamics, and current research on cell senescence--and the general model--cell senescence as the central component in human senescence and cancer. For each human malignancy, the chapter reviews and analyzes all available data on telomeres and telomerase, as well as summarizing current work on their clinical application in both diagnosis and cancer therapy. The second edition, oriented by organs and tissues, explores the actual physiological impact of cell senescence and aging on clinical disease. After a summary of the literature on early aging syndromes--the progerias--the text reviews aging diseases (Alzheimer's dementia, osteoarthritis, atherosclerosis, immune aging, presbyopia, sarcopenia, etc.) in the context of the tissues in which they occur. Each of the ten clinical chapters--skin, cardiovascular system, bone and joints, hematopoietic and immune systems, endocrine, CNS, renal, muscle, GI, and eyes--examines what we know of their pathology, the role of cell senescence, and medical interventions, both current and potential.

Molecular Basis of Aging Prentice Hall

This volume of the subcellular Biochemistry series will attempt to bridge the gap between the subcellular events that are related to aging as they were described in the first volume of this set of two books and the reality of aging as this is seen in clinical practice. All chapters will start from the biochemistry or cell biology, where the data is available and work up towards the understanding that we have of aging in the various areas that are related to the subject. Key focus points for this volume are nutrition, external factors and genetics on aging. There will also be chapters that will focus on various organs or tissues in which aging has been well studied, like the eyes, the muscles, the immune system and the bones. The aim of the book project and the book project that is published in concert with this volume is to bring the subcellular and clinical areas into closer contact.

Biologie Anatomie Physiologie Springer Science & Business Media

Using a new, integrative approach, *Molecular Basis of Aging* describes the aging phenomenon within mammalian organisms from the perspective of changes in information storage and coordination between hierarchical orders of structure. This unique approach provides the reader with a thorough insight into the evolution of molecular, cellular, tissue, and organ systems and processes in mammals. This informative

volume contains up-to-date reviews of:

Adipose Tissue: Which Role in Aging and Longevity? Springer Science & Business Media

Aging of somatic stem cells reduces cell function and results in dysfunctional organs and tissues, making it an underlying cause of diseases associated with aging. It might even be the primary cause for age-associated attrition of tissue function in organs that heavily rely on stem cells for maintaining homeostasis, like the skin, blood and intestines. Understanding the molecular and cellular mechanisms involved is critical for developing approaches to attenuate stem cell aging and could pave the way for improved quality of life among the elderly. Written by highly prominent experts in the field, this book presents the current state of knowledge on these mechanisms. It offers insights into stem cell function, explains in detail the mechanisms of stem cell aging in model organisms as well as mammalian systems and describes related diseases and approaches to attenuating stem cell aging or achieving rejuvenation. The book is intended for all scientists and clinicians working with stem cells, aging mechanisms or age-related diseases.

Physiological Basis of Aging and Geriatrics Good Press

Experimental gerontological research is necessary to obtain optimal information and thus ensure proper drug therapy for the elderly. Most older persons acquire multiple diseases, first of all chronic diseases. They involve complex problems of a physical, social, and psychological nature. The multimorbidity of the elderly raises many questions in drug therapy. By contrast with our extensive knowledge of pharmacokinetics and pharmacodynamics in younger age groups, few facts are available in respect of the elderly. A variety of factors may influence drug therapy. Physiological and pathological age-related changes of molecules, cells, organs, and the total organism may interact to enhance or inhibit drug therapy in higher age groups. It is well known that elderly patients are overmedicated and therefore the incidence of adverse drug reactions increases with age. Elderly patients with multimorbidity often have a diminished body clearance of drugs; age-related changes of the kidney seems to be one of the most important factors in this regard. Far less important than the elimination of drugs through the kidney is their excretion in the bile. So far results have disclosed that oxidative steps in drug clearance are more likely to be disturbed than phase II reactions. Furthermore; changes in distribution volume and age-

related alterations in receptor sensitivity also influence the clearance of drugs in the elderly.

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