

Skeletal Muscle Form And Function 2nd Edition 2nd Second Edition By Macintosh Brian Gardiner Phillip Mccomas Alan 2005

-Softcover reprint of a successful hardcover reference (370 copies sold) -Price to be accessible to the rapidly increasing population of students and investigators in the field of tissue engineering -Chapters written by well-known researchers discuss issues in functional tissue engineering as well as provide guidelines and a summary of the current state of technology

Frailty is considered a multisystem impairment that makes an individual vulnerable to external or internal stressors. Sarcopenia, the age-dependent loss of muscle mass and function, is proposed as the biological substrate and the pathway whereby the consequences of physical frailty develop. These syndromes are associated with a negative impact in quality of life and can lead to the occurrence of disability, institutionalization, and even mortality. The book focuses upon all the related aspects of frailty and sarcopenia and the new advancements in the related treatments including complex issues and research. It includes high-quality chapters in all related aspects for the syndromes of sarcopenia and frailty, which adversely affect the function and overall effectiveness of the musculoskeletal system and interventions to promote rehabilitation.

The extracellular matrix (ECM) is an ensemble of non-cellular components present within all tissues and organs of the human body. The ECM provides structural support for scaffolding cellular constituents and biochemical and biomechanical support for those events leading to tissue morphogenesis, differentiation and homeostasis. Essential components of all ECMs are water, proteins and polysaccharides. However, their composition, architecture and bioactivity greatly vary from tissue to tissue in relation to the specific role the ECM is required to assume. This book overviews the role of the ECM in different tissues and organs of the human body.

The ability of striated muscle tissue to adapt to changes in activity or in working conditions is extremely high. In some ways it is comparable to the ability of the brain to learn. The interest in muscle adaptation is increasing in relation to the idea that physical fitness helps in the prevention of disease, may counteract the loss of physical performance and generally improves wellbeing. Plasticity is the word used since the late 1970's to indicate collectively all the processes and mechanisms which form the background of muscle adaptation. This book aims to provide a systematic updating of the available knowledge on molecular and cellular mechanisms, as well as on changes at whole muscle level. The book means to be a guide and a help for people who enter the field as PhD or medical students, but is also a tool for refreshing and updating knowledge for people already active in the field in basic sciences as well as in applied disciplines such as neurology, sports science and rehabilitation.

Cardioskeletal Myopathies in Children and Young Adults focuses on plaques that kill people in their 40's-50's and the way they start to form in young adulthood. The Annals of Family Medicine report that approximately half of young adults have at least one cardiovascular disease risk factor (Mar 2010), and an increase in cardiovascular mortality rates in young adults was substantiated in a study at Northwestern Medicine (Nov 2011). Given the increasing recognition of genetic triggers behind all types of cardiovascular disease, and the growing population of young adults with primary or acquired myocardial disease, the need has arisen for a reference that offers a comprehensive approach to the understanding of basic, translational, and clinical aspects of specific muscle diseases while making the link between young adult and adult health. Reveals the link between cardiac muscle disease and skeletal muscle disease Explains how genetics and environmental factors effect muscle function of diverse origins Designates current and novel therapeutic strategies that target both cardiac and skeletal muscle systems

Skeletal Muscle Form and Function Human Kinetics

Skeletal Muscle Mechanics: From Mechanisms to Function summarises the variety of approaches used by today's scientist to understand muscle function and the mechanisms of contraction. This book contains research by leading scientists from numerous fields using many different scientific techniques. Topics covered include: * Cellular and molecular mechanisms of skeletal muscle contraction * Historical perspective of muscle research * The newest developments in techniques for the determination of the mechanical properties of single cross-bridges * Theoretical modelling of muscle contraction and force production * Multifaceted approaches to determine the in vivo function of skeletal muscle This state-of-the-art account is written by internationally recognised authors and will be a valuable resource to researchers of biomechanics in sports science and exercise physiology. "I expect this book to be excellent and timely." Professor R. McNeill Alexander FRS, School of Biology, University of Leeds, UK

Advanced Neuromuscular Exercise Physiology uses a mix of biochemistry, molecular biology, neurophysiology, and muscle physiology to provide a synthesis of current knowledge and research directions in the field. The first text devoted solely to the topic, Advanced Neuromuscular Exercise Physiology assists readers in identifying current directions in research and new avenues for exploration. Recognizing the rapid changes occurring in the field of neuromuscular exercise physiology, the text provides readers with a foundation of knowledge while detailing the most recent findings. Though the text is written at an advanced level, the author succeeds at making the content accessible.

Analyses of research findings and research applications are highlighted in special sidebars. Detailed illustrations and graphs assist readers in understanding research findings. Chapter summaries also help readers determine the key issues presented for each topic. The author draws attention to a variety of important topics in the field, beginning with a discussion of motor unit types, muscle blood flow, and metabolic pathways in control of metabolism, including a special discussion of the effects of type 2 diabetes. Next, the topic of fatigue is discussed. The author explains possible peripheral and central contributors to fatigue. Chapters 6 and 7 focus on whole-body endurance training, including the effects of aerobic endurance training on the protein profiles of muscle fibers and on the central nervous system. Of particular interest is the applicability of research information to the exercise rehabilitation of individuals with compromised nervous system function, such as spinal cord injury, other trauma, and neuromuscular diseases. The final chapters are devoted to resistance training, including the phenotypic responses of muscles to isometric, slow isotonic, lengthening, and plyometric training. An overview of the effects of resistance training on the nervous system is offered along with clinical applications. Within the dynamic field of neuromuscular exercise physiology, ideas of how nerves and muscles collaborate during acute and chronic exercise are continually evolving. Advanced Neuromuscular Exercise Physiology offers an authoritative perspective of current research in the field as it seeks to encourage discussion, further study, and new research directions. Human Kinetics' Advanced Exercise Physiology Series offers books for advanced undergraduate and graduate students as well as professionals in exercise science and kinesiology. These books highlight the complex interaction of the various systems both at rest and during exercise. Each text in this series offers a concise explanation of the system and details how each is affected by acute exercise and chronic exercise training. Advanced Neuromuscular Exercise Physiology is the third volume in the series.

Spinal Muscular Atrophy: Disease Mechanisms and Therapy provides the latest information on a condition that is characterized by motoneuron loss and muscle atrophy, and is the leading genetic cause of infant mortality. Since the identification of the gene responsible for SMA in 1995, there have been important advances in the basic understanding of disease mechanisms, and in therapeutic development. This book provides a comprehensive accounting of recent advances in basic and clinical research that covers SMA clinical features and standards of care, multifaceted aspects of SMN protein functions and SMA disease pathology, various animal models, and biomarkers, as well as current therapeutic development. This title is ideal for graduate students/postdocs and principal investigators who are already in the SMA field and need to keep updated on recent findings and approaches, and for those who are new to, or would like to join, the field. Likewise, users will find an excellent source of reading for biotech/pharma scientists, clinical researchers, and practitioners, regulators, and patients and their advocacy organizations. Furthermore, this book is a handy reference for researchers and clinicians who may want to apply the research strategies and therapeutic approaches in SMA to other rare diseases. Provides comprehensive, up-to-date reviews by leading investigators on diverse topics of SMA, including clinical features and patient care, SMN genetics and protein functions, animal models, disease pathology and mechanisms, biomarkers, current therapeutic development, and the role of non-profit organizations in therapeutic development. Written to bridge multiple disciplines and promote better communications among basic scientists, clinical researchers, and health care providers on the latest developments in SMA. Includes outstanding questions and perspectives for future investigations and key references for additional detailed study.

The extremely potent substance botulinum neurotoxin (BoNT) has attracted much interest in diverse fields. Originally identified as cause for the rare but deadly disease botulism, military and terrorist intended to misuse this sophisticated molecule as biological weapon. This caused its classification as select agent category A by the Centers for Diseases Control and Prevention and the listing in the Biological and Toxin Weapons Convention. Later, the civilian use of BoNT as long acting peripheral muscle relaxant has turned this molecule into an indispensable pharmaceutical world wide with annual revenues >\$1.5 billion. Also basic scientists value the botulinum neurotoxin as molecular tool for dissecting mechanisms of exocytosis. This book will cover the most recent molecular details of botulinum neurotoxin, its mechanism of action as well as its detection and application.

A two-color page layout, portable size, and a list of the "Top 100 Secrets" in pathology help students and residents to better meet the challenges they face today. They will find all of the features they rely on the Secret Series® for-a question-and-answer format, lists, mnemonics, and tables and an informal tone that make reference fast and easy. No matter what questions arise in practice or while preparing for boards, this 3rd Edition has the answers-in print and online. Uses bulleted lists, tables, short answers, and a highly detailed index to expedite reference. Features 20 new figures, pearls, tips, memory aids, and "secrets" from the experts. Covers all of today's most common procedures and techniques. Includes a list of the "Top 100 Secrets" to keep in mind during a rotation or residency. Features a compact, trim size (5 1/4" x 8 1/2") for enhanced portability. Makes information easier to find with a two-color page layout and "Key Points" boxes. Identifies useful websites to make it easy to find additional information on a specific topic and provides live links in the online version. Self Assessment exercises and matching Q&A for every chapter online with Student Consult to prepare for exams and focus your study on particular areas that you need the most. Includes STUDENT CONSULT access! www.studentconsult.com is an innovative website that allows you to build a personalized, fully integrated, online library, where you'll find. The entire contents of every STUDENT CONSULT title you purchase. Powerful search capabilities- View all excerpts relevant to keyword or subject searches (up to 300 words per hit) from every book in the series. Image library POCKETConsult- Download portions of your personal library onto your handheld device. Student resources- Sharpen your skills, stay informed, and have fun! More!

Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand. We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts.

The loss of skeletal muscle mass and strength substantially impairs physical performance and quality of life. This book details some approaches to the treatment of muscle wasting. It also reviews novel applications against pulmonary arterial hypertension such as cell reprogramming and the use of anticancer drugs that induce programmed cell death. Vascular smooth muscle cells (VSMCs) are the most prevalent cell types in blood vessels and serve critical regulatory roles. This publication also introduces mathematical models concerning the molecular mechanism and targets of cyclic guanosine 3',5'-monophosphate (cGMP) in the contraction of VSMCs. This book will be of interest to professionals in clinical practice, medical and health care students, and researchers working in muscle-related fields of science.

Skeletal Muscle: Form and Function, Second Edition, provides readers with a detailed understanding of the different facets of muscle physiology. Meticulously researched and

updated, this text examines motoneuron and muscle structure and function. It is intended for those who need to know about skeletal muscle--from undergraduate and graduate students gaining advanced knowledge in kinesiology to physiotherapists, physiatrists, and other professionals whose work demands understanding of muscle form and function. A unique feature of this book is that it combines basic sciences (anatomy, physiology, biophysics, and chemistry) with clinical applications (detection of disease and genetic mutations and training and rehabilitation). Each chapter ends with a section on clinical and other applied aspects of the information presented in that chapter, showing, for example, how specific defects of muscle or nerve cells can result in certain clinical disorders. The result is a thorough understanding of skeletal muscle structure and physiology. This new edition includes the following: The latest research in all areas of muscle physiology; Major revisions of chapters covering muscle contraction, muscle metabolism, and fatigue; More than 200 drawings (many of them original) and 30 photos (mostly micrographs), all of which clarify and augment the text; Pedagogical aids to facilitate comprehension, including key points in the margins, special interest points, an index, and a greatly expanded glossary. Skeletal Muscle: Form and Function, Second Edition, is divided into three parts. Part I presents the structures of the neuromuscular system: muscle, motoneurons, and neuromuscular junctions and sensory receptors as well as the development of these structures. Part II examines muscle function, including neuromuscular transmission, muscle contraction, motor units, and muscle metabolism. Part III focuses on the adaptability of the neuromuscular system. Among the issues it explores are fatigue, loss and recovery of muscle innervation, trophism, muscle training, and injury and repair. The depth and breadth of the contents, combined with the practical applications, make this book the leading authority on the structure, electrophysiology, and adaptability of human skeletal muscle. It is an excellent text for students and a practical and up-to-date reference for professionals.

Muscle disease represents an important health threat to the general population. There is essentially no cure. Gene therapy holds great promise to correct the genetic defects and eventually achieve full recovery in these diseases. Significant progresses have been made in the field of muscle gene therapy over the last few years. The development of novel gene delivery vectors has substantially enhanced specificity and efficiency of muscle gene delivery. The new knowledge on the immune response to viral vectors has added new insight in overcoming the immune obstacles. Most importantly, the field has finally moved from small experimental animal models to human patients. This book will bring together the leaders in the field of muscle gene transfer to provide an updated overview on the progress of muscle gene therapy. It will also highlight important clinical applications of muscle gene therapy.

Breathing is usually automatic and without conscious effort; yet our breathing is a complex motor function requiring the coordinated activation of a number of respiratory muscles that span from our heads to our abdomen. Some of our respiratory muscles serve to pump air into and out of our lungs (ventilation). These pump muscles act on the thoracic and abdominal walls and are all skeletal muscles. Other respiratory muscles in our bodies control the caliber of the passageway for air to enter our lungs. These airway muscles include skeletal muscles of the head (e.g., tongue and suprahyoid muscles) and neck (infrahyoid, pharyngeal and laryngeal muscles), as well as smooth muscles that line our trachea and bronchi down to the alveoli where gas exchange occurs. This book provides an overview of the anatomy and physiology of our respiratory muscles, including their neural control. This book also includes an overview of the basic structure and function of both skeletal and smooth muscles. The two basic types of respiratory muscles (skeletal and smooth muscle) vary considerably in the organization of their contractile proteins and the underlying mechanisms that lead to force generation and contraction, including their neural control. Table of Contents: Introduction / Respiratory Pump Muscles / Airway Muscles / Muscle Structure and Function / Muscle Fiber Proteins / Neural Control of Respiratory Muscles / References / Author Biographies

An understanding of muscle structure and function, and its control in health and failure in disease is a basis for a full understanding of human physiology. This book combines basic but up-to-date information about the structure, biochemistry and physiology of muscle with discussions on the use of muscle in everyday life, in sport and in disease.

Provides readers with a detailed understanding of the different facets of muscle physiology. Examines motoneuron and muscle structure and function. It is intended for those need to know about skeletal muscle--from undergraduate and graduate students gaining advanced knowledge in kinesiology to physiotherapists, physiatrists, and other professionals whose work demands understanding of muscle form and function.

The Comparative Structure and Function of Muscle is based upon a series of lectures given at the University of Lancaster over the last seven years, and it follows a natural division into structure, electrophysiology and excitation and mechanical activity. Within each section, an attempt is made to cover all muscle types in as wide a range of animals as the literature will allow. This book comprises 10 chapters, with the first one focusing on the fine structure of skeletal muscle. The following chapters then discuss the fine structure of cardiac and visceral muscle; the innervation of muscle; the ionic basis of the resting potential; the action potential and the activation of muscle; electrical activity and electrochemistry of invertebrate skeletal muscle; electrical activity of invertebrate and vertebrate cardiac muscle; the electrical activity and electrochemistry of visceral muscle; the mechanics of muscle; and excitation-contraction coupling and relaxation. This book will be of interest to practitioners in the fields of anatomy and the health sciences.

Attempts to cover a wide range of both basic research and applied clinical topics related to skeletal muscle damage and repair mechanisms and their application. This book examines muscle damage and repair mechanisms and issues in specific populations including older adults and special populations.

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Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanys: 9780781775939 .

In its Second Edition, this text addresses basic and applied physiological properties of skeletal muscle in the context of the physiological effects from clinical treatment. Many concepts are expanded and recent studies on human muscle have been added. This new edition also includes more clinically relevant cases and stories. A two-page full color insert of muscle sections is provided to ensure integral understanding of the concepts presented in the text. Anyone interested in human movement analysis and the

understanding of generation and control from the musculoskeletal and neuromuscular systems in implementing movement will find this a valuable resource.

Essential textbook for all undergraduate students of neurobiology, physiology, cell biology and preclinical medicine.

The Physiological Basis of Rehabilitation Medicine: Second Edition presents a comprehensive examination of the management of patients with functional impairments due to disease or trauma. It discusses the distinction between disabilities and impairments per se. It addresses the method in which the human body adapts and compensates for the stress produced by physical injuries. Some of the topics covered in the book are the physiology of cerebellum and basal ganglia; description of upper and lower motor neurons; anatomy of the vascular supply to the brain; characteristics of the autonomic nervous system; structure, chemistry, and function of skeletal muscle; the receptors in muscle; and cardiopulmonary physiology. The role of muscle spindles in perception of limb position and movement is fully covered. An in-depth account of the physiology of synovial joints and articular cartilage are provided. The cellular and glandular components of the skin are completely presented. A chapter is devoted to the factors involve in wound healing. Another section focuses on the nerve conduction and neuromuscular transmission. The book can provide useful information to doctors, dermatologists, students, and researchers.

This complete, full-color atlas of bones and joints contains over 700 illustrations and explains how muscles function as movers, antagonists, and stabilizers so readers will truly understand how muscles function in the human body. It includes the bones, landmarks, and joints, as well as an introduction to the basics of how muscles function (beginning kinesiology). It also provides clinical applications related to the kinesiology concepts presented and includes an explanation of anatomical and physiological terminology that is needed for work in the musculoskeletal field. Finally, this book covers microanatomy and microphysiology, such as the sliding filament theory and the structure and function of fascia. Clinical applications throughout the text, as they relate to the kinesiology concepts covered, enable students to apply the knowledge learned in the classroom to clinical practice. Over 100 full-color photographs of every bone in the human body gives readers comprehensive coverage of bones not found in other kinesiology books. Clear, full-color line drawings that highlight each topic in the overview of the human body, joints of the human body, and muscle function parts. Thorough coverage of joints in six chapters that provide information on structure, function, terminology, and specific illustrations on each joint in the human body: joints of the axial body, joints of the upper extremity, and joints of the lower extremity. Includes an explanation of anatomical and physiological terminology that is needed for work in the musculoskeletal field.

In order to complete tissue regeneration, various cells (neuronal, skeletal and smooth) interact coordinately with each other. This book, Muscle Cell and Tissue - Current Status of Research Field, deals with current progress and perspectives in a variety of topics on the skeletal and smooth muscle, stem cells, regeneration, disease or therapeutics. Novel applications for cell and tissue engineering including cell therapy, tissue models and disease pathology modeling are introduced. This book also deals with the differentiation/de-differentiation process of vascular smooth muscle cells in health and disease. Furthermore, natural products to reverse metabolic syndromes are descriptively reviewed. These chapters can be interesting for graduate students, teachers, physicians, executives and researchers in the field of molecular biology and regenerative medicine.

In its Third Edition, this text addresses basic and applied physiological properties of skeletal muscle in the context of the physiological effects from clinical treatment. Anyone interested in human movement analysis and the understanding of generation and control from the musculoskeletal and neuromuscular systems in implementing movement will find this a valuable resource. A highlight color has been added to this edition's updated figures and tables, and the color plates section has been doubled, ensuring that all figures that need color treatment to clarify concepts receive this treatment. A new Clinical Problem feature uses concepts presented in each chapter in the context of a specific clinical case—for example, a spinal cord injury, a sports accident, or rehabilitation after bed rest.

An easy-to-read survey of all the latest developments in molecular cardiologic research and therapy. The authors explain in a readable style the complex process of the heart's development, the molecular basis of cardiovascular diseases, and the translation of these research advances to actual clinical treatments. The expert information provided here serves as an invaluable building block for novel treatments of cardiovascular diseases and includes a comprehensive discussion of cardiac function and dysfunction, coronary artery disease, cardiac arrhythmias, vascular diseases, and risk factors for cardiovascular disease. These state-of-the-art approaches to molecular cardiologic research include critical discussion of such topics as the molecular events that regulate angiogenesis and the potential for angiogenic therapy, emerging therapies for arrhythmias, and a description of the molecular biology of aging and its impact on the cardiovascular system.

Strong roots in basic science and research enhance clinical practice. This book is a rich source of information for basic scientists and translational researchers who focus on musculoskeletal tissues and for orthopedic and trauma surgeons seeking relevant up-to-date information on molecular biology and the mechanics of musculoskeletal tissue repair and regeneration. The book opens by discussing biomaterials and biomechanics, with detailed attention to the biologic response to implants and biomaterials and to the surface modification of implants, an important emerging research field. Finite element analysis, mechanical testing standards and gait analysis are covered. All these chapters are strongly connected to clinical applications. After a section on imaging techniques, musculoskeletal tissues and their functions are addressed, the coverage including, for example, stem cells, molecules important for growth and repair, regeneration of cartilage, tendons, ligaments, and peripheral nerves, and the genetic basis of orthopedic diseases. State-of-the-art applications such as platelet rich plasma were included. Imaging is a daily practice of scientists and medical doctors. Recent advancements in ultrasonography, computerized tomography, magnetic resonance, bone mineral density measurements using dual energy X-ray absorptiometry, and scintigraphy was covered following conventional radiography basics. Further extensive sections are devoted to pathology, oncogenesis and tumors, and pharmacology. Structure is always related with function. Surgical anatomy was therefore covered extensively in the last section.

The aim of this treatise is to summarize the current understanding of the mechanisms for blood flow control to skeletal muscle under resting conditions, how perfusion is elevated (exercise hyperemia) to meet the increased demand for oxygen and other substrates during exercise, mechanisms underlying the beneficial effects of regular physical activity on cardiovascular health, the regulation of transcapillary fluid filtration and protein flux across the microvascular exchange vessels, and the role of changes in the skeletal muscle circulation in pathologic states. Skeletal muscle is unique among organs in that its blood flow can change over a remarkably large range. Compared to blood flow at rest, muscle blood flow can increase by more than 20-fold on average during intense exercise, while perfusion of certain individual white muscles or portions of those muscles can increase by as much as 80-fold. This is compared to maximal increases of 4- to 6-fold in the coronary circulation during exercise. These increases in muscle perfusion are required to meet the enormous demands for oxygen and nutrients by the active muscles. Because of its large mass and the fact that skeletal muscles receive 25% of the cardiac output at rest, sympathetically mediated vasoconstriction in vessels supplying this tissue allows central hemodynamic variables (e.g., blood pressure) to be spared during stresses such as hypovolemic shock. Sympathetic vasoconstriction in skeletal muscle in such pathologic conditions also effectively shunts blood flow away from muscles to tissues that are more sensitive to reductions in their blood supply that might otherwise occur. Again, because of its large mass and percentage of cardiac output directed to skeletal muscle, alterations in blood vessel structure and function with chronic disease (e.g., hypertension) contribute significantly to the pathology of such disorders. Alterations in skeletal muscle vascular resistance and/or in the exchange properties of this vascular bed also modify transcapillary fluid filtration and solute movement across the microvascular barrier to influence muscle function and contribute to disease pathology. Finally, it is clear that exercise training induces an adaptive transformation to a protected phenotype in the vasculature supplying skeletal muscle and other tissues to promote overall cardiovascular health. Table of Contents: Introduction / Anatomy of Skeletal Muscle and Its Vascular Supply / Regulation of Vascular Tone in Skeletal Muscle / Exercise Hyperemia and Regulation of Tissue Oxygenation During Muscular Activity / Microvascular Fluid and Solute Exchange in Skeletal Muscle / Skeletal Muscle Circulation in Aging and Disease States: Protective Effects of Exercise / References

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