

Animal Physiology From Genes To Organisms

Organized around the central theme of homeostasis, FUNDAMENTALS OF HUMAN PHYSIOLOGY is a carefully condensed version of Lauralee Sherwood's HUMAN PHYSIOLOGY: FROM CELLS TO SYSTEMS. It provides clear, current, concise, clinically oriented coverage of physiology. Many analogies and frequent references to everyday experiences help students relate to the physiology concepts presented. Offering helpful art and pedagogical features, Sherwood promotes understanding of the basic principles and concepts of physiology rather than memorization of details and provides a foundation for future careers in the health professions. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Sturkie's Avian Physiology is the classic comprehensive single volume on the physiology of domestic as well as wild birds. The Sixth Edition is thoroughly revised and updated, and features several new chapters with entirely new content on such topics as migration, genomics and epigenetics. Chapters throughout have been greatly expanded due to the many recent advances in the field. The text also covers the physiology of flight, reproduction in both male and female birds, and the immunophysiology of birds. The Sixth Edition, like the earlier editions, is a must for anyone interested in comparative physiology, poultry science, veterinary medicine, and related fields. This volume establishes the standard for those who need the latest and best information on the physiology of birds. Includes new chapters on endocrine disruptors, magnetoreception, genomics, proteomics, mitochondria, control of food intake, molting, stress, the avian endocrine system, bone, the metabolic demands of migration, behavior and control of body temperature. Features extensively revised chapters on the cardiovascular system, pancreatic hormones, respiration, pineal gland, pituitary gland, thyroid, adrenal gland, muscle, gastro-intestinal physiology, incubation, circadian rhythms, annual cycles, flight, the avian immune system, embryo physiology and control of calcium. Stands out as the only comprehensive, single volume devoted to bird physiology. Offers a full consideration of both blood and avian metabolism on the companion website (<http://booksite.elsevier.com/9780124071605>). Tables feature hematological and serum biochemical parameters together with circulating concentrations of glucose in more than 200 different species of wild birds.

This Comprehensive, Fully Updated Text Describes The Essential Concepts Of Animal Physiology And Related Biochemistry For Students Of Biology And Related Disciplines. In Terms Of Presentation And Contents, The Book Offers Relevant Fundamentals Of Physiology And Animal Behaviour Under Diverse Conditions. The Text Will Certainly Satisfy The Needs Of Students Of Biology, Home Science And Animal Husbandry. Key Features * Covers Physiology Of Organ Systems Of Animals, Including Human And Mammalian Physiology. * Surveys Functional Specialisation Of Organisms And Their Survival Ability Under Environmental Stresses. * Explains Criteria Of Physiological Variations Among Organisms Living In Diverse Habitats. * New Coverage On Animal Calorimetry To Explain Energy Requirements Of Animals. * In Depth Coverage Of Membrane Physiology. * A New Chapter On Physiological Disorders Emanating From Organellar Malfunctions And Genetic Disabilities.

Promoting a conceptual understanding and taking an integrative systems approach, ANIMAL PHYSIOLOGY, 2E, International Edition illustrates the individual organization as well as the collective interdependence of each complete physiological system. The text begins with chapters on integrative principles and on the genomic, molecular, and cellular basis of physiology, then proceeds to chapters on individual organ systems. For each organ system, evolutionary forces as well as current cellular and molecular research are discussed. To clearly illustrate system interdependence, each systems chapter contains a summary, titled "Making Connections." To make the text even more accessible to students, the authors also incorporate

a comparative approach to animal physiology, examining the basic physiology of many vertebrate and nonvertebrate animals as well as their primary diseases and ability to respond to environmental changes.

Neuroscience is, by definition, a multidisciplinary field: some scientists study genes and proteins at the molecular level while others study neural circuitry using electrophysiology and high-resolution optics. A single topic can be studied using techniques from genetics, imaging, biochemistry, or electrophysiology. Therefore, it can be daunting for young scientists or anyone new to neuroscience to learn how to read the primary literature and develop their own experiments. This volume addresses that gap, gathering multidisciplinary knowledge and providing tools for understanding the neuroscience techniques that are essential to the field, and allowing the reader to design experiments in a variety of neuroscience disciplines. Written to provide a "hands-on" approach for graduate students, postdocs, or anyone new to the neurosciences Techniques within one field are compared, allowing readers to select the best techniques for their own work Includes key articles, books, and protocols for additional detailed study Data analysis boxes in each chapter help with data interpretation and offer guidelines on how best to represent results Walk-through boxes guide readers step-by-step through experiments

Animal Physiology: An Environmental Perspective provides a broad review of animal physiology, demonstrating how an understanding of the physiology of animals in their natural habitats helps us to understand how and why animals evolved the way they did, as well as how we can protect them from the extreme effects of changes to their environments. The only text to take an evolutionary approach to show how physiological systems allow animals to adapt to their changing environments The main narrative focuses on key concepts, and panels expand on particular topics or themes, helping students to grasp difficult concepts in a progressive, layered way. A robust yet accessible introduction to the physical and chemical properties of the environments in which animals live helps students to avoid a superficial or confused understanding of this often challenging aspect of the subject Carefully chosen examples illustrate how different groups of animals have evolved different solutions to deal with the environmental problems they face The exploration of real world issues such as climate change and pollution from the point of view of their physiological effects on animals shows how our understanding of such topics can be translated into new approaches to conservation. Additional Resources: For students: - Original articles: a list of original articles consulted during the writing of each chapter so that you can explore the original research for yourself. - Additional case studies and experimental approach panels to augment those in the printed book. - Answers to numerical questions: full solutions to numerical questions so that you can verify your working. For registered adopters of the text: - Digital image library: Includes electronic files in JPG format of every illustration, photo, graph and table from the text

Principles of Animal Physiology, Second Edition continues to set a new standard for animal physiology textbooks with its focus on animal diversity, its modern approach and clear foundation in molecular and cell biology, its concrete examples throughout, and its fully integrated coverage of the endocrine system. Carefully designed, full-color artwork guides students through complex systems and processes while in-text pedagogical tools help them learn and remember the material. The book includes the most up-to-date research on animal genetics and genomics, methods and models, and offers a diverse range of vertebrate and invertebrate examples, with a student-friendly writing style that is consistently clear and engaging.

Number and size of muscle fibres in relation to meat production. Fibre type identification and functional characterization in adult livestock animals. Manipulation of muscle fibre number during prenatal development. The effect of growth and exercise on muscle characteristics in relation to meat quality. Nutrition, hormone receptor expression and gene interactions:

implications for development and disease. The impact of minerals and micronutrients on growth control. Na⁺ K⁺-ATPase in skeletal muscle: significance of exercise and thyroid hormones for development and performance. local and systemic regulation of muscle growth. Proteolytic systems and the regulation of muscle remodelling and breakdown. The muscle regulatory factors gene family in relation to meat production. The muscle transcriptome. Genome analysis of QTL for muscle tissue development and meat quality. Functional genomics and proteomics in relation to muscle tissue. Role of myostatin in muscle growth. The callipyge mutation for sheep muscular hypertrophy genetics, physiology and meat quality. Genetic control of intramuscular fat accretion, Post-mortem muscle proteolysis and meat tenderness. Water-holding capacity of meat.

Animal Physiology: From Genes to Organisms Cengage Learning

Rudolf Raff is recognized as a pioneer in evolutionary developmental biology. In their 1983 book, *Embryos, Genes, and Evolution*, Raff and co-author Thomas Kaufman proposed a synthesis of developmental and evolutionary biology. In *The Shape of Life*, Raff analyzes the rise of this new experimental discipline and lays out new research questions, hypotheses, and approaches to guide its development. Raff uses the evolution of animal body plans to exemplify the interplay between developmental mechanisms and evolutionary patterns. Animal body plans emerged half a billion years ago. Evolution within these body plans during this span of time has resulted in the tremendous diversity of living animal forms. Raff argues for an integrated approach to the study of the intertwined roles of development and evolution involving phylogenetic, comparative, and functional biology. This new synthesis will interest not only scientists working in these areas, but also paleontologists, zoologists, morphologists, molecular biologists, and geneticists.

Ask anyone who has owned a pet and they'll assure you that, yes, animals have personalities. And science is beginning to agree. Researchers have demonstrated that both domesticated and nondomesticated animals—from invertebrates to monkeys and apes—behave in consistently different ways, meeting the criteria for what many define as personality. But why the differences, and how are personalities shaped by genes and environment? How did they evolve? The essays in *Animal Personalities* reveal that there is much to learn from our furred and feathered friends. The study of animal personality is one of the fastest-growing areas of research in behavioral and evolutionary biology. Here Claudio Carere and Dario Maestriperi, along with a host of scholars from fields as diverse as ecology, genetics, endocrinology, neuroscience, and psychology, provide a comprehensive overview of the current research on animal personality. Grouped into thematic sections, chapters approach the topic with empirical and theoretical material and show that to fully understand why personality exists, we must consider the evolutionary processes that give rise to personality, the ecological correlates of personality differences, and the physiological mechanisms underlying personality variation. Animal physiology is the scientific study of how the bodies of animals function. How does an animal breathe, develop, eat and digest, reproduce, control its activities? The field encompasses the molecular, cellular, tissue and organ systems of animals. This book looks at an eclectic selection of studies in animal physiology, including how animals adapt to their physical environments, how human interaction can affect animal functioning, and much more. "The concept for this text arose from the 18th Discover Conference on Effect of the Thermal Environment on Nutrient and Management Requirements of Cattle, which was held at the Brown County Inn in Nashville, Indiana November 2-5, 2009"--Pref.

Featuring key pieces of art from the text, this coloring book allows students to engage with the material in a hands-on manner. Integrated areas ask students to explain the processes attached to the figures in their own words to improve retention.

Scientific Frontiers in Developmental Toxicology and Risk Assessment reviews advances made during the last 10-15 years in fields such as developmental

biology, molecular biology, and genetics. It describes a novel approach for how these advances might be used in combination with existing methodologies to further the understanding of mechanisms of developmental toxicity, to improve the assessment of chemicals for their ability to cause developmental toxicity, and to improve risk assessment for developmental defects. For example, based on the recent advances, even the smallest, simplest laboratory animals such as the fruit fly, roundworm, and zebrafish might be able to serve as developmental toxicological models for human biological systems. Use of such organisms might allow for rapid and inexpensive testing of large numbers of chemicals for their potential to cause developmental toxicity; presently, there are little or no developmental toxicity data available for the majority of natural and manufactured chemicals in use. This new approach to developmental toxicology and risk assessment will require simultaneous research on several fronts by experts from multiple scientific disciplines, including developmental toxicologists, developmental biologists, geneticists, epidemiologists, and biostatisticians.

Can the structures that animals build--from the humble burrows of earthworms to towering termite mounds to the Great Barrier Reef--be said to live? However counterintuitive the idea might first seem, physiological ecologist Scott Turner demonstrates in this book that many animals construct and use structures to harness and control the flow of energy from their environment to their own advantage. Building on Richard Dawkins's classic, *The Extended Phenotype*, Turner shows why drawing the boundary of an organism's physiology at the skin of the animal is arbitrary. Since the structures animals build undoubtedly do physiological work, capturing and channeling chemical and physical energy, Turner argues that such structures are more properly regarded not as frozen behaviors but as external organs of physiology and even extensions of the animal's phenotype. By challenging dearly held assumptions, a fascinating new view of the living world is opened to us, with implications for our understanding of physiology, the environment, and the remarkable structures animals build.

Promoting a conceptual understanding and taking an integrative systems approach, *ANIMAL PHYSIOLOGY 2E* illustrates the individual organization as well as the collective interdependence of each complete physiological system. The text begins with chapters on integrative principles and on the genomic, molecular, and cellular basis of physiology, then proceeds to chapters on individual organ systems. For each organ system, evolutionary forces as well as current cellular and molecular research are discussed. To clearly illustrate system interdependence, each systems chapter contains a summary, titled *Making Connections*. To make the text even more accessible to students, the authors also incorporate a comparative approach to animal physiology, examining the basic physiology of many vertebrate and nonvertebrate animals as well as their primary diseases and ability to respond to environmental changes.

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"What does everyone in the modern world need to know? [The author's] answer to this most difficult of questions uniquely combines the hard-won truths of ancient tradition with the stunning revelations of cutting-edge scientific research. [The author discusses] discussing discipline, freedom, adventure and responsibility, distilling the world's wisdom into 12 practical and profound rules for life"--

The International Symposium on Ruminant Physiology (ISRP) is the premier forum for presentation and discussion of advances in knowledge of the physiology of ruminant animals. This book contains the main papers presented at the symposium.

Conceptual Breakthroughs in Ethology and Animal Behavior highlights, through concise summaries, the most important discoveries and scientific revolutions in animal behavior. These are assessed for their relative impact on the field and their significance to the forward motion of the science of animal behavior. Eighty short essays capture the moment when a new concept emerged or a publication signaled a paradigm shift. How the new understanding came about is explained, and any continuing controversy or scientific conversation on the issue is highlighted. Behavior is a rich and varied field, drawing on genetics, evolution, physiology, and ecology to inform its principles, and this book embraces the wealth of knowledge that comes from the unification of these fields around the study of animals in motion. The chronological organization of the essays makes this an excellent overview of the history of animal behavior, ethology, and behavioral ecology. The work includes such topics as Darwin's role in shaping the study of animal behavior, the logic of animal contests, cognition, empathy in animals, and animal personalities. Succinct accounts of new revelations about behavior through scientific investigation and scrutiny reveal the fascinating story of this field. Similar to Dr. John Avise's Contemporary Breakthroughs in Evolutionary Genetics, the work is structured into vignettes that describe the conceptual revolution and assess the impact of the conceptual change, with a score, which ranges from 1-10, providing an assessment of the impact of the new findings on contemporary science. Features a lively, brisk writing style and brief entries to enable easy, enjoyable access to this essential information Includes topics that cover the range of behavioral biology from mechanism to behavioral ecology Can also be used as supplemental material for an undergraduate animal behavior course, or as the foundational text for an upper level or graduate discussion course in advanced animal behavior

The new and updated edition of this accessible text provides a comprehensive overview of the comparative physiology of animals within an environmental context. Includes two brand new chapters on Nerves and Muscles and the Endocrine System. Discusses both comparative systems physiology and environmental physiology. Analyses and integrates problems and adaptations for each kind of environment: marine, seashore and estuary, freshwater, terrestrial and parasitic. Examines mechanisms and responses beyond physiology. Applies

an evolutionary perspective to the analysis of environmental adaptation. Provides modern molecular biology insights into the mechanistic basis of adaptation, and takes the level of analysis beyond the cell to the membrane, enzyme and gene. Incorporates more varied material from a wide range of animal types, with less of a focus purely on terrestrial reptiles, birds and mammals and rather more about the spectacularly successful strategies of invertebrates. A companion site for this book with artwork for downloading is available at:

www.blackwellpublishing.com/willmer/

This book examines three ways plants respond to their changing environment. The first example can be found in all plants. Despite the extreme changes in weather, plants have to stay where they are and respond to whatever nature produces. Plants have the capacity to respond quickly and yet they can evolve in a single generation. The second example addresses how an individual leaf has to respond rapidly and repeatedly to maintain the proper balance of carbon dioxide (CO₂) and water so that it can photosynthesize but not dry out. This delicate balance is governed by a pair of cells that regulate the size of openings on leaves. The final chapter examines a unique example of a leaf that can move fast enough to trap insects and digest them. This book presents data that led to our understanding of how plants function on different time scales.

Since publication of the first edition, huge developments have taken place in sensory biology research and new insights have been provided in particular by molecular biology. These show the similarities in the molecular architecture and in the physiology of sensory cells across species and across sensory modality and often indicate a common ancestry dating back over half a billion years. *Biology of Sensory Systems* has thus been completely revised and takes a molecular, evolutionary and comparative approach, providing an overview of sensory systems in vertebrates, invertebrates and prokaryotes, with a strong focus on human senses. Written by a renowned author with extensive teaching experience, the book covers, in six parts, the general features of sensory systems, the mechanosenses, the chemosenses, the senses which detect electromagnetic radiation, other sensory systems including pain, thermosensitivity and some of the minority senses and, finally, provides an outline and discussion of philosophical implications. New in this edition: Greater emphasis on molecular biology and intracellular mechanisms New chapter on genomics and sensory systems Sections on TRP channels, synaptic transmission, evolution of nervous systems, arachnid mechanosensitive sensilla and photoreceptors, electroreception in the Monotremata, language and the FOXP2 gene, mirror neurons and the molecular biology of pain Updated passages on human olfaction and gustation. Over four hundred illustrations, boxes containing supplementary material and self-assessment questions and a full bibliography at the end of each part make *Biology of Sensory Systems* essential reading for undergraduate students of biology, zoology, animal physiology, neuroscience, anatomy and physiological psychology. The book is also suitable for postgraduate students in more specialised courses such as vision sciences, optometry, neurophysiology, neuropathology, developmental biology. Praise from the reviews of the first edition: "An excellent advanced undergraduate/postgraduate textbook." ASLIB BOOK GUIDE "The emphasis on comparative biology and evolution is one of the distinguishing features of this self-contained book. this is an informative and thought-provoking text..." TIMES HIGHER EDUCATIONAL SUPPLEMENT

Pork is the most widely produced meat in the world. To cover the demands of a fast growing population, new scientific knowledge in genetics, physiology and nutrition is generated, which contributes in a general increase of production performance. Production systems can be improved by constructing models which help to optimise use of the means of production and intensify production. In some regions where production intensity is high, concerns about

environmental pollution are increasingly becoming a limiting factor. Consumers, and with them the retailer organisations, are voicing serious concerns about the production systems and especially the use of feed additives. In the context of the above, the question of the quality of pork becomes a relevant issue. A general view can only be obtained by taking all factors into consideration. The diverse aspects of pork quality were covered in the session on "Quality of Meat and Fat as Affected by Genetics and Nutrition" at the 50th annual meeting of the EAAP in Zurich. This publication presents the review presentations which give an overview from the different perspectives of meat quality and its use in human nutrition: genetics, physiology, animal nutrition, meat consumption and human health and consumer concerns. In addition, 38 short communications provide up-to-date knowledge on the subject of quality from a European perspective.

An overview of recombinant DNA techniques and surveys advances in recombinant molecular genetics, experimental methods and their results.

This Book of Abstracts is the main publication of the 71st Annual Meeting of the European Federation of Animal Science (EAAP). It contains abstracts of the invited papers and contributed presentations of the sessions of EAAP's eleven Commissions: Animal Genetics, Animal Nutrition, Animal Management and Health, Animal Physiology, Cattle Production, Sheep and Goat Production, Pig Production, Horse Production and Livestock Farming Systems, Insects and Precision Livestock Farming.

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The Fourth Edition of Knobil & Neill continues to serve as a reference aid for research, to provide the historical context to current research, and most importantly as an aid for graduate teaching on a broad range of topics in human and comparative reproduction. In the decade since the publication of the last edition, the study of reproductive physiology has undergone monumental changes. Chief among these advances are in the areas of stem cell development, signaling pathways, the role of inflammation in the regulatory processes in the various tissues, and the integration of new animal models which have led to a greater understanding of human disease. The new edition synthesizes all of this new information at the molecular, cellular, and organismal levels of organization and present modern physiology a more understandable and comparative context. The Fourth Edition has been extensively revised, reflecting new fundamental advancements in this rapidly advancing field. Provides a common language for researchers across the fields of physiology, endocrinology, and biology to discuss their understanding of reproduction. Saves academic researchers time in quickly accessing the very latest details on reproductive physiology, as opposed to searching through thousands of journal articles.

Introduction to Animal Physiology and Physiological Genetics, deals with topics on physiological measurement, comparisons, and analysis of the role of genotypes. This book emphasizes two aspects — the changes of physiological patterns in the course of development and the wide variation that can be found within a species. The text discusses the response mechanisms of living organisms from nerve impulses, chemical sense, muscle reaction, and includes some studies made on brain function. The effects of nutrition and energy such as the intake of food, water, oxygen, and the calculation of basic metabolic rates are explained. The book then discusses the role of the internal environment and that of the interstitial body fluid in the higher animals. The discussion covers blood circulation, cardiac cycle, and a special section on the function of the heartbeat in the spider *Limulus* showing that stimulation of the abdominal ganglia

increases the heartbeats. The text also considers significant concepts of physiological genetics, and then explains asexual and sexual reproduction, the sex hormones of invertebrates, and the use of stimulants for animal production. The physiological differences between species are examined, but more particularly on the reservoir of genetic diversity, where differences abound between families and offspring. One research made in molecular biology concludes that genes are responsible for regulating the amino acid sequence of proteins. Molecular biologists, general biologists, zoologists, and microbiologists will find the articles in this collection invaluable. *Animal Physiology, Fourth Edition* presents all the branches of modern animal physiology with a strong emphasis on integration of physiological knowledge, ecology, and evolutionary biology.

Laboratory animals are becoming increasingly important for biomedical research. It is said that approximately 70% of biomedical research is associated with the use of experimental animals. Laboratory animal research not only expands our knowledge of science, but also greatly improves human and animal health. The field of laboratory animal science is ever-growing and changing as new experimental techniques are developed and new animal models are created. It is essential to know not only the biological features of each laboratory animal but also how to use and care for them responsibly in order to perform high-quality experiments. Courses in beginning Laboratory Animal Science are starting to be offered in many universities throughout the world. However, a practical introductory textbook that contains state-of-the-art techniques is still lacking. *Fundamentals of Laboratory Animal Science* provides comprehensive information on the principles and practices of using laboratory animals for biomedical research. Each individual chapter focuses on a key sub-discipline of laboratory animal science: animal welfare and best humane care practices in the laboratory; the quality control of laboratory animals; the anatomy, physiology, and husbandry of commonly used species; the principles of creating and using animal models for studying human diseases; practical techniques used for laboratory animal experiments; experimental design; and animal experimentation management. Knowledge of this broad spectrum of concepts and skills will ensure research goes smoothly while greatly reducing animal pain and distress. Well-illustrated and thoroughly referenced, this book will serve not only as a standard textbook but also as a handy guide for veterinarians, researchers, animal care staff, administrators, and other professionals who are involved in laboratory animal science.

Genetic-based animal biotechnology has produced new food and pharmaceutical products and promises many more advances to benefit humankind. These exciting prospects are accompanied by considerable unease, however, about matters such as safety and ethics. This book identifies science-based and policy-related concerns about animal biotechnology—key issues that must be resolved before the new breakthroughs can reach their potential. The book includes a short history of the field and provides understandable definitions of terms like cloning. Looking at technologies on the near horizon, the authors discuss what we know and what we fear about their effects—the inadvertent release of dangerous microorganisms, the safety of products derived from biotechnology, the impact of genetically engineered animals on their environment. In addition to these concerns, the book explores animal welfare concerns, and our societal and institutional capacity to manage and regulate the technology and

