

# Principles of Animal Physiology by Moyes and Schulte: A Comprehensive and Integrative Textbook

Animal physiology is the study of how animals function, from the molecular and cellular level to the whole organism. It is a fascinating and diverse field that encompasses topics such as metabolism, thermoregulation, osmoregulation, respiration, circulation, digestion, excretion, endocrinology, reproduction, development, behavior and ecology. Understanding animal physiology is essential for many applications in biology, medicine, veterinary science, agriculture, conservation and biotechnology. One of the most popular and widely used textbooks in animal physiology is *Principles of Animal Physiology* by Christopher D. Moyes and Patricia M. Schulte. This book is designed to provide second- and third-year undergraduate students with an approach that balances its presentation of comparative physiology with mechanistic topics. The book delivers the fundamentals of animal physiology while providing an integrative learning experience that draws on ideas from chemistry, physics, mathematics, molecular biology and cell biology for its conceptual underpinnings. The book is divided into six parts: Introduction to Physiological Principles; Food, Energy and Temperature; Integrating Systems; Movement and Muscle; Oxygen, Carbon Dioxide and Internal Transport; Water, Salts and Excretion. Each part consists of several chapters that cover a specific topic in depth. The chapters are organized into three sections: Concepts; Examples; and Integration. The Concepts section introduces the key concepts and principles of the topic. The Examples section illustrates how these concepts are applied to different animal groups using case studies and research examples. The Integration section synthesizes the information and shows how it relates to other topics in animal physiology. The book also features several pedagogical tools that enhance student learning and comprehension. These include learning objectives, key terms, summaries, review questions, critical thinking questions, problems, online quizzes, animations, videos and interactive simulations. The book also comes with a companion website that provides additional resources for instructors and students. *Principles of Animal Physiology* by Moyes and Schulte is a comprehensive and integrative textbook that covers all the major topics in animal physiology with clarity, rigor and relevance. It is suitable for students who have a basic background in biology and chemistry and who want to learn more about how animals work. One of the distinctive features of *Principles of Animal Physiology* is its emphasis on comparative physiology. The book explores how different animals have evolved different physiological adaptations to cope with various environmental challenges and lifestyles. For example, the book discusses how animals regulate their body temperature in different thermal environments, how animals cope with low oxygen levels at high altitudes or in aquatic habitats, how animals maintain water and salt balance in freshwater or marine environments, and how animals digest different types of food. The book also highlights the diversity of animal form and function by using examples from a wide range of animal groups, including invertebrates, vertebrates, mammals, birds, reptiles, amphibians and fish. Another distinctive feature of *Principles of Animal Physiology* is its focus on mechanistic physiology. The book explains how physiological processes work at the molecular, cellular, tissue, organ and system levels. For example, the book describes how enzymes catalyze biochemical reactions, how membrane transport proteins move molecules across cell membranes, how hormones and neurotransmitters regulate cellular activities, how action potentials propagate along neurons and

muscle fibers, how sensory receptors detect stimuli and transduce signals, how neural networks process information and generate behavior, how blood vessels and heart valves control blood flow and pressure, how gas exchange occurs in lungs and gills, how kidneys filter blood and produce urine, and how muscles generate force and movement. The third edition of *Principles of Animal Physiology* has been updated and revised to reflect the latest advances and discoveries in animal physiology. The book incorporates new research findings, new examples and case studies, new figures and tables, new online resources and new pedagogical features. The book also has a new design and layout that enhances its readability and visual appeal. The book is available in both print and digital formats.

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