Biology 155 General Biology I Laboratory Supplement

In the spring of 2011, a diverse group of scientists gathered at Cornell University to discuss their research into the nature and origin of biological information. This symposium brought together experts in information theory, computer science, numerical simulation, thermodynamics, evolutionary theory, whole organism biology, developmental biology, molecular biology, genetics, physics, biophysics, mathematics, and linguistics. This volume presents new research by those invited to speak at the conference.The contributors to this volume use their wide ranging expertise in the area of biological information to bring fresh insights into the many explanatory difficulties associated with biological information. These authors raise major challenges to the conventional scientific wisdom, which attempts to explain all biological information exclusively in terms of the standard mutation/selection paradigm.Several clear theme emerged from these research papers: 1) Information is indispensable to our understanding of what life is; 2) Biological information is more than the material structures that embody it; 3) Conventional chemical and evolutionary mechanisms seem insufficient to fully explain the labyrinth of information that is life. By exploring new perspectives on biological information, this volume seeks to expand, encourage, and enrich research into the nature and origin of biological information.

Despite not being a disease in and of itself, antibiotic resistance could be considered the global epidemic of modern times, since it produces the failure to prevent and treat many infectiou diseases. This can ultimately lead to untreatable microbial infections becoming more widespread and this will significantly increase morbidity and mortality. This worldwide problem is estimated to cause millions of deaths per year and could become an even more significant menace to humanity than established illnesses, such as cancer. In February 2017, the World H Organization (WHO) published a list of antibiotic-resistant “priority pathogens” – a catalogue of 12 families of bacteria which pose the greatest threat to human health - and Acinetobacter baumannii is leading the list. The most critical group includes multidrug-resistant bacteria, which pose a particular threat in hospitals, nursing homes, and among patients whose care requires devices such as ventilators and blood catheters. This group includes Acinetobacter, Pseudomonas, and various Enterobacteriaceae and they are often associated with deadly infections, such as bloodstream infections and pneumonia. Furthermore, these bacteria have become resistant to a large number of antibiotics, including carbapenems and third generati cephalosporins – the best available antibiotics for treating multidrug-resistant bacteria. A. baumannii is a particularly worrisome example and demands attention: This pathogen turned int menace to humans during the late 70s, likely as a result of intense antibiotic use in hospital settings, and became one of the microorganisms that are challenging the antibiotic era. Its extreme genome plasticity, combined with mechanisms of horizontal genetic transfer, have played a key role in the evolution of this microorganism, as well as its adaptability to unfavorab environments. However, its pathophysiology, as well as the mechanisms leading to its success as a pathogen, are not that simple to unveil. However, what is clear is that the triad of host pathogen-environment is crucial in selection and establishment of multidrug-resistant clones and outbreaks. Indeed, there are still many aspects of this pathogen that require a deeper understanding - not only regarding mechanisms of resistance but also its global pathophysiology. For example, basic understanding of transmission mechanisms; knowledge of ‘external’ factors modulating persistence of the pathogen; genetic effects on host susceptibility and infectiousness; mechanisms of pathogenicity and their dynamics; and genetic variation of the pathogen affecting virulence and transmissibility are some aspects that would require further study. Furthermore, the importance of other members of the genus as important nosocomial pathogens, such as Acinetobacter nosocomialis, has been increasingly recognized during the last few years.

The volume presents a survey of the research by Kurt Wüthrich and his associates during the period 1965 to 1994. A selection of reprints of original papers on the use of NMR spectrosc structural biology is supplemented with an introduction, which outlines the foundations and the historical development of the use of NMR spectroscopy for the determination of three-dimensional structures of biological macromolecules in solution. The original papers are presented in groups highlighting protein structure determination by NMR, studies of dynamic properties and hydration of biological macromolecules, and practical applications of the NMR methodology in fields such as enzymology, transcriptional regulation, immunosuppression a protein folding.

With contributions by numerous experts

Biological Systems, Biodiversity, and Stability of Plant Communities

Anthracycline Chemistry and Biology I

Brachyura

Ecology of North American Freshwater Fishes

Biology

A Handbook for College Faculty

GENERAL BIOLOGY: Investigating Life is an introductory level college biology textbook that provides students with an accessible and engaging look at the fundamentals of biology. Written for a two-term, undergraduate course of mixed majors and non-majors, this reader-friendly text is concept driven vs. terminology driven. That is, the text is based on the underlying concepts and principles of biology rather than strict memorization of terminology. Written in a student-centered, conversational style, this educational research-based textbook uniquely connects students and our society to living things from various perspectives economic, ecologic, medical, and cultural, exploring how the biological world and human realm are intimately intertwined. End-of-chapter questions challenge students to think critically and creatively while incorporating science process skills and biological principles.

"Based on the work of Peter H. Raven, President Emeritus, Missouri Botanical Garden; George Engelmann, Professor of Botany Emeritus, Washington University, George B. Johnson, Professor Emeritus of Biology, Washington University."

The North American freshwater fish fauna is the most diverse and thoroughly researched temperate fish fauna in the world. Ecology of North American Freshwater Fishes is the only textbook to provide advanced undergraduate and graduate students and researchers with an up-to-date and integrated view of the ecological and evolutionary concepts, principles, and processes involved in the formation and maintenance of this fauna. Ecology of North American Freshwater Fishes provides readers with a broad understanding of why specific species and assemblages occur in particular places. Additionally, the text explores how individuals and species interact with each other and with their environments, how such interactions have been altered by anthropogenic impacts, and the relative success of efforts to restore damaged ecosystems. This book is designed for use in courses related to aquatic and fish ecology, fish biology, ichthyology, and related advanced ecology and conservation courses, and is divided into five sections for ease of use. Chapter summaries, supplemental reading lists, online sources, extensive figures, and color photography are included to guide readers through the material and facilitate student learning. Part 1: Faunal origins, evolution, and diversity Presents a broad pictureÑboth spatially and temporallyÑof the derivation of the fauna, including global and regional geological and climatological processes and their effects on North American fishes. Part 2: Formation, maintenance, and persistence of local populations and assemblages Focuses on how local fish populations and assemblages are formed and how they persist, or not, through time. Part 3: Form and function Deals with the relationship of body form and life history patterns as they are related to ecological functions. Part 4: Interactions among individuals and species Discusses the numerous interactions among individuals and species through communication, competition, predation, mutualism, and facilitation. Part 5: Issues in conservation Focuses on several primary conservation issues such as flow alterations and the increasing biotic homogenization of faunas.

Systems Biology represents a new paradigm aiming at a whole-organism-level understanding of biological phenomena, emphasizing interconnections and functional interrelationships rather than component parts. The study of network properties, and how they control and regulate behavior from the cellular to organism level, constitutes a main focus of Systems Biology. This book addresses from a novel perspective a major unsolved biological problem: understanding how a cell works and what goes wrong in pathology. The task undertaken by the authors is in equal parts conceptual and methodological, integrative and analytical, experimental and theoretical, qualitative and quantitative, didactic and comprehensive. Essentially, they unravel the spatio-temporal unfolding of interacting mass-energy and information networks at the cellular and organ levels, as well as its modulation through activation or repression by signaling networks to produce a certain phenotype or (patho)physiological response. Starting with the historical roots, in thirteen chapters this work explores the Systems Biology of signaling networks, cellular structures and fluxes, organ and microorganism functions. In doing so, it establishes the basis of a 21st century approach to biological complexity.

History, Philosophy, and Practical Concerns

Proceedings of Symposium held at the Royal Geographical Society, London on 29 and 30 September 1966

Lobsters: Biology, Fisheries and Aquaculture

Models, Processes, and Directions

Biological Occurence and Biosynthesis, Synthesis and Chemistry

Philosophy of Systems Biology

This book discusses theoretical approaches to the taxonomy of biological systems and theory and mathematical approaches to the problem of plant diversity, cultivation, and the environment. Particular attention is given to theoretical and practical problems of soil and the environmental sustainability of phytocoenosis, with the goal to enhance the productivity of agricultural crops: cereals, legumes, vegetables, and fruit. Providing valuable information on the distribution of chemical elements in the soil–plant system and on the migration of chemical elements in the food chain, this book looks at the composition of the soil and the distribution of elements in the soil–plant system that are manifested as adaptations of plant organism to environmental conditions. With chapters written by acknowledged scientists in the field of genetics, plant selection, ecology, and agro-economy, the book attempts, in many cases, to find consensus between the need to address ways to decrease the excess load on the environment and the need to provide adequately for the human population in agro-developed countries. This book also presents precision farming techniques, including the introduction of differentiated agrochemicals and considering variability of soil fertility and crop conditions. An important element for the conservation and adaptation of plant organism to environmental conditions is the use of physiologically active compounds.

This volume, 9C, covers the Brachyura.

Phylogenetic comparative approaches are powerful analytical tools for making evolutionary inferences from interspecific data and phylogenies. The phylogenetic toolkit available to evolutionary biologists is currently growing at an incredible speed, but most methodological papers are published in the specialized statistical literature and many are incomprehensible for the user community. This textbook provides an overview of several newly developed phylogenetic comparative methods that allow to investigate a broad array of questions on how phenotypic characters evolve along the branches of phylogeny and how such mechanisms shape complex animal communities and interspecific interactions. The individual chapters were written by the leading experts in the field and using a language that is accessible for practicing evolutionary biologists. The authors carefully explain the philosophy behind different methodologies and provide pointers – mostly using a dynamically developing online

interface – on how these methods can be implemented in practice. These "conceptual" and "practical" materials are essential for expanding the qualification of both students and scientists, but also offer a valuable resource for educators. Another value of the book are the accompanying online resources (available at: http://www.mpcm-evolution.com), where the authors post and permanently update practical materials to help embed methods into practice.

Handbook of the Biology of Aging, Seventh Edition, reviews and synthesizes recent findings and discoveries in the field. This volume is part of The Handbooks of Aging series, which also includes The Handbook of the Psychology of Aging and The Handbook of Aging and the Social Sciences. The book is organized into two parts. Part 1 covers basic aging processes. It covers concepts relevant to clinical research, such as muscle, adipose tissue, and stem cells. It discusses research on how dietary restriction can slow down the aging process and extend life in a wide range of species. Part 2 deals with the medical physiology of aging. It contains several chapters on the aging of the human brain. These chapters deal not only with diseases but also with normal aging changes to cerebral vasculature and myelination as well as the clinical implications of those changes. Additional chapters cover how aging affects central features of human health such as insulin secretion, pulmonary and cardiac function, and the ability to maintain body weight and body temperature. The volume is primarily directed at basic researchers who wish to keep abreast of new research outside their own subdiscipline. It will also be useful to medical, behavioral, and social gerontologists who want to learn about the discoveries of basic scientists and clinicians. Contains basic aging processes as determined by animal research as well as medical physiology of aging as known in humans Covers hot areas of research, like stem cells, integrated with longstanding areas of interest in aging like telomeres, mitochondrial function, etc. Edited by one of the fathers of gerontology (Masoro) and contributors represent top scholars in gerintology

Concepts and Practice

Systems Biology of Metabolic and Signaling Networks

New Perspectives

Mathematics, and Engineering: 1949-50 Through 1959-60

Undergraduate Mathematics for the Life Sciences

A Primer on the Temporal Organization of Life, with Implications for Health, Society, Reproduction, and the Natural Environment

In the spring of 2011, a diverse group of scientists gathered at Cornell University to discuss their research into the nature and origin of biological information. This symposium brought together experts in information theory, computer science, numerical simulation, thermodynamics, evolutionary theory, whole organism biology, developmental biology, molecular biology, genetics, physics, biophysics, mathematics, and linguistics. This volume presents new research by those invited to speak at the conference. The contributors to this volume use their wide-ranging expertise in the area of biological information to bring fresh insights into the many explanatory difficulties associated with biological information. These authors raise major challenges to the conventional scientific wisdom, which attempts to explain all biological information exclusively in terms of the standard mutation/selection paradigm. Several clear themes emerged from these research papers: 1) Information is indispensable to our understanding of what life is; 2) Biological information is more than the material structures that embody it; 3) Conventional chemical and evolutionary mechanisms seem insufficient to fully explain the labyrinth of information that is life. By exploring new perspectives on biological information, this volume seeks to expand, encourage, and enrich research into the nature and origin of biological information.

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.

50 Techniques for Engaging Students and Assessing Learning in College Courses Do you want to: Know what and how well your students are learning? Promote active learning in ways that readily integrate assessment? Gather information that can help make grading more systematic and streamlined? Efficiently collect solid learning outcomes data for institutional assessment? Provide evidence of your teaching effectiveness for promotion and tenure review? Learning Assessment Techniques provides 50 easy-to-implement active learning techniques that gauge student learning across academic disciplines and learning environments. Using Fink's Taxonomy of Significant Learning as its organizational framework, it embeds assessment within active learning activities. Each technique features: purpose and use, key learning goals, step-by-step implementation, online adaptation, analysis and reporting, concrete examples in both on-site and online environments, and key references—all in an easy-to-follow format. The book includes an all-new Learning Goals Inventory, as well as more than 35 customizable assessment rubrics, to help teachers determine significant learning goals and appropriate techniques.

Readers will also gain access to downloadable supplements, including a worksheet to guide teachers through the six steps of the Learning Assessment Techniques planning and implementation cycle. College teachers today are under increased pressure to teach effectively and provide evidence of what, and how well, students are learning. An invaluable asset for college teachers of any subject, Learning Assessment Techniques provides a practical framework for seamlessly integrating teaching, learning, and assessment.

Glycostructures play a highly diverse and crucial role in a myriad of organisms and systems in biology, physiology, medicine, and bioengineering and technology. Only in recent years have the tools been developed to partly understand the highly complex functions and chemistry behind them. In this set the editors present up-to-date information on glycostructures, their chemistry and chemical biology, in the form of a comprehensive survey. The text is accompanied by over 2000 figures, chemical structures and reaction schemes and more than 9000 references. The accompanying CD-ROM enables, besides text searches, searches for structures, schemes, and other information.

Unraveling the Biology, Genetics, and Host/Environmental Interactions of Acinetobacter

Biological Information: New Perspectives - Proceedings Of The Symposium

Fish atlas of the Celtic Sea, North Sea, and Baltic Sea

Marine Physiology Down East: The Story of the Mt. Desert Island Biological Laboratory

GENERAL BIOLOGY I

Biological Information

Courses of InstructionCatalogueGENERAL BIOLOGY IMolecules, Cells and GenesDog Ear Publishing

Biology and the Manufacturing Industries focuses on the appreciation of the role of biology in the operations of manufacturing industries. Divided into four parts with 18 chapters, the book contains the literature of various authors who have diligently conducted studies on the relationship of biology and the manufacturing industries. The discussions start with the industrial aspects of microbial food production, particularly focusing on the symba-yeast process, pest control, and the factors affecting continuous fermentation. The book also notes the impact of manufacturing industries on agriculture. The book considers the importance of biological factors to the design and operation of power stations, as well as the biological processes in the treatment and disposal of waste waters. This topic includes actions to be taken regarding microbiological problems as well as the conduct of research sponsored by the manufacturing industries. The discussions progresses to how sensory methods can solve flavor problems in the food industry. The toxicity of potential drugs is also given importance. Lastly, the role of biologists in the industries, as well as their role as industrial engineers, is emphasized. The book is a must for readers who are interested in exploring the role of biology in the manufacturing industries and other fields.

Advances in Enzymology and Related Areas of Molecular Biology is a seminal series in the field of biochemistry, offering researchers access to authoritative reviews of the latest discoveries in all areas of enzymology and molecular biology. These landmark volumes date back to 1941, providing an unrivaled view of the historical development of enzymology. The series offers researchers the latest understanding of enzymes, their mechanisms, reactions and evolution, roles in complex biological process, and their application in both the laboratory and industry. Each volume in the series features contributions by leading pioneers and investigators in the field from around the world. All articles are carefully edited to ensure thoroughness, quality, and readability. With its wide range of topics and long historical pedigree, Advances in Enzymology and Related Areas of Molecular Biology can be used not only by students and researchers in molecular biology, biochemistry, and enzymology, but also by any scientist interested in the discovery of an enzyme, its properties, and its applications.

This book is an important addition to the knowledge of lobster research. The book complements other books published on lobster research and management as it focuses on Indian lobster fisheries and aquaculture developments where there have been nearly 350 research papers and reports and 19 PhD awards. The book has 15 chapters written by international experts covering many aspects of the biology of a number of spiny and slipper lobster species occurring in India and world oceans with maps illustrating global distribution of spiny lobster families, genera and species. An updated taxonomy and checklist of marine lobsters, the status and management of lobster fisheries in India and Indian Ocean Rim countries and a review of aquaculture research in India and other major countries have also been presented. The book is timely as the 2nd International Indian Ocean Expedition (IIOE) is currently underway (2015-2020), 50 years after the original IIOE (1959-1965), with some of the original lobster research on the biology and distribution of phyllosoma larvae being undertaken on the plankton samples collected during the first IIOE. Many of the chapters are contributed by the authors from Central Marine Fisheries Research Institute (CMFRI), which has been collecting fishery and biological data on lobsters since 1950 when lobster fishing began on a subsistence scale, followed by some industrial fishing for lobsters in different parts of India. Unfortunately, the development of some of these lobster fisheries was followed by overfishing due to lack of enforcement of regulations. The book provides a valuable addition to our knowledge of the biology, fisheries and aquaculture of spiny and slipper lobsters.

Treatise on Zoology - Anatomy, Taxonomy, Biology. The Crustacea, Volume 9 Part C (2 vols)

Modern Phylogenetic Comparative Methods and Their Application in Evolutionary Biology

Model Systems in Biology

Based on international research-vessel surveys

Concepts of Biology

Evo-Devo: Non-model Species in Cell and Developmental Biology

Mechanisms in Radiobiology, Volume II: Multicellular Organisms presents the development of radiobiology, which has run parallel with the advancement of biology. This book discusses the fundamental aspects of radiobiology in connection with the therapeutic use of X-rays in medicine. Organized into five chapters, this book begins with an overview of radiation effects on embryonic and adult organisms, particularly in mammals. This text then discusses the immunological processes in irradiated organisms. Other chapters consider the mechanisms of action of protective and sensitizing agents and examine the primary or secondary effects of the irradiation on the various organs. This book discusses as well the experimental possibilities of improving the recovery of irradiated mammals. The final chapter deals with the reactions of living organisms after a damaging dose of ionizing radiation, which is determined by a variety of biological and physical factors. This book is a valuable resource for radiobiologists, pathologists, scientists, physicists, clinicians, and research workers.

Sea urchins are a major component of marine environments found throughout the world's oceans. A major model for research in developmental biology, they are also of major economic importance in many regions and interest in their management and aquaculture has increased greatly in recent years. This book provides a synthesis of biological and ecological characteristics of sea urchins that are of basic scientific interest and also essential for effective fisheries management and aquaculture. General chapters consider characteristics of sea urchins as a whole. In addition, specific chapters are devoted to the ecology of 17 species that are of major commercial interest and ecological importance. Features include: • A synthesis of what is known about the basic biological characteristics of the sea urchin, useful for the direction of future research. • Case histories of 17 species that illustrate their ecological role in a variety of environments. • With the catastrophic decline in fisheries resulting primarily from over-fishing, it is essential that the populations be managed effectively and that aquaculture be developed. This book provides knowledge of the biology and ecology of the commercially important sea urchins that will contribute to these goals. • The only book available in present literature devoted to sea urchins. With this new title experts provide a broad synthetic treatment and in depth analysis of the biology and ecology of sea urchins from around the world, designed to provide an understanding of the group and the basis for fisheries management and aquaculture.

Behavior and Ecology discusses the ecology and behavior of crustaceans. It presents an update and overview of most of the dominant lines of research in crustacean biology. This book is divided into six chapters. Chapter 1 deals with the rapidly advancing topic of how crustaceans communicate with members of the same species as well as on an interspecific basis. Chapter 2 provides a synthesis and review of patterns of movement and orientation of crustaceans in nature. Chapter 3 reviews the basic concepts in the regulation of biological rhythms, surveys rhythms in Crustacea, and then analyzes the data from an ecological perspective. Chapter 4 summarizes symbiotic relationships of crustaceans with other crustacean and noncrustacean hosts. Chapter 5 cites work on adaptation of egg and development to the environment. Chapter 6 discusses assemblages of organisms into populations and communities. This book is a valuable source for zoologists, paleontologists, ecologists, physiologists, endocrinologists, morphologists, pathologists, and fisheries biologists, and an essential reference work for institutional libraries.

In this book I have tried to bring together the major developments in the study of insect populations in tropical environments. In some ways, this task has been a difficult one because conceptually it is virtually impossible to limit a discussion of insect ecology to the tropics, since the same concepts, theories, and hypoth eses concerning the mechanisms by which habitats support insect populations often apply both to temperate and to tropical regions. Thus one might argue effectively that a book such as Peter Price's Insect Ecology represents a more comprehensive treatment of insect ecology, including the tropical aspects. Yet because there has been a tremendous amount of new study on insects in the tropics in recent years, and because there has also been a strong historical interest in tropical insects, judging from early museum expeditions and medically and agriculturally oriented studies of insects in the New and Old World tropics, I believe there is a place for a book dealing almost exclusively with tropical insects. But logically so, such a book by necessity incorporates data and informa tion from Temperate Zone studies, if for no other reason than because insights into the properties of tropical environments often emerge from compariso'ns of species, communities, or faunas between temperate and tropical regions. An understanding of insect populations in the tropics cannot be divorced from a consideration of Temperate Zone populations.

Multicellular Organisms

General Register

Behavior and Ecology

University of Michigan Official Publication

Biology and the Manufacturing Industries

Catalogue

The emergence of systems biology raises many fascinating questions: What does it mean to take a systems approach to problems in biology? To what extent is the use of mathematical and computational modelling changing the life sciences? How does the availability of big data influence research practices? What are the major challenges for biomedical research in the years to come? This book addresses such questions of relevance not only to philosophers and biologists but also to readers interested in the broader implications of systems biology for science and society. The book features reflections and original work by experts from across the disciplines including systems biologists, philosophers, and interdisciplinary scholars investigating the social and educational aspects of systems biology. In response to the same set of questions, the experts develop and defend their personal perspectives on the distinctive character of systems biology and the challenges that lie ahead. Readers are invited to engage with different views on the questions addressed, and may explore numerous themes relating to the philosophy of systems biology. This edited work will appeal to scholars and all levels, from undergraduates to researchers, and to those interested in a variety of scholarly approaches such as systems biology, mathematical and computational modelling, cell and molecular biology, genomics, systems theory, and of course, philosophy of biology.

The atlas presents a unique set of abundance data to describe the spatial, depth, size, and temporal distribution of demersal and pelagic fish species over an extensive marine area, together with accounts of their biology. A large number of pictures, graphs and distribution maps illustrate the text. By largely avoiding - or at least explaining - scientific terms and providing extensive references, the book should be useful for both laymen and scientists. The quantitative information on some 200 fish taxa is derived from 72,000 stations fished by research vessels during the period 1977-2013. The area covers the northwest European shelf from west of Ireland to the central Baltic Sea and from Brittany to the Shetlands. Although the surveys extend beyond the shelf edge, only taxa reported at least once in waters less than 200 m are included. Typical deep-water species and typical fresh-water species are excluded. We hope this publication will contribute to gaining a better understanding of the ocean ecosystems.

Introducing Biological Rhythms is a primer that serves to introduce individuals to the area of biological rhythms. It describes the major characteristics and discusses the implications and applications of these rhythms, while citing scientific results and references. Also, the primer includes essays that provide in-depth historic and other background information for those interested in more specific topics or concepts. It covers a basic cross-section of the field of chronobiology clearly enough so that it can be understood by a novice, or an undergraduate student, but that it would also be sufficiently technical and detailed for the scientist.

Announcements for the following year included in some vols.
Introducing Biological Rhythms
The Biology of Tooth Movement
Population Biology of Tropical Insects
Molecules, Cells and Genes
Mechanisms in Radiobiology
Advances in Enzymology and Related Areas of Molecular Biology

Evolutionary developmental biology or evo-devo is a field of biological research that compares the underlying mechanisms of developmental processes in different organisms to infer the ancestral condition of these processes and elucidate how they have evolved. It addresses questions about the developmental bases of evolutionary changes and evolution of developmental processes. The book's content is divided into three parts, the first of which discusses the theoretical background of evo-devo. The second part highlights new and emerging model organisms in the evo-devo field, while the third and last part explores the evo-devo approach in a broad comparative context. To the best of our knowledge, no other book combines these three evo-devo aspects: theoretical considerations, a comprehensive list of emerging model species, and comparative analyses of developmental processes. Given its scope, the book will offer readers a new perspective on the natural diversity of processes at work in cells and during the development of various animal groups, and expand the horizons of seasoned and young researchers alike.

:Written by a broad spectrum of dental, medical and basic science researchers from around the world, this book presents state-of-the-art knowledge concerning the biology of connective tissues and their response to exogenous mechanical stimulation at the cell biology level. The text goes well beyond the traditional morphologic descriptions of tooth movement, covering the cell biology of the connective tissues involved, the various in vitro and in vivo research models, possible pharmacological means of influencing tissue responses, and biophysical considerations. Many cellular events that occur during tooth movement are discussed, as well as the exciting challenges, unanswered questions and possibilities in the future. This publication is extremely relevant to the work of dental specialists in orthodontics, pediatric dentistry, and periodontics plus orthopeadists and basic scientists working in connective tissue research.

How biomedical research using various animal species and in vitro cellular systems has resulted in both major successes and translational failure. In Model Systems in Biology, comparative neurobiologist Georg Striedter examines how biomedical researchers have used animal species and in vitro cellular systems to understand and develop treatments for human diseases ranging from cancer and polio to Alzheimer's disease and schizophrenia. Although there have been some major successes, much of this "translational" research on model systems has failed to generalize to humans. Striedter explores the history of such research, focusing on the models used and considering the question of model selection from a variety of perspectives—the philosophical, the historical, and that of practicing biologists. Striedter reviews some philosophical concepts and ethical issues, including concerns over animal suffering and the compromises that result. He traces the history of the most widely used animal and in vitro models, describing how they compete with one another in a changing ecosystem of models. He examines how therapies for bacterial and viral infections, cancer, cardiovascular diseases, and neurological disorders have been developed using animal and cell culture models—and how research into these diseases has both taken advantage of and been hindered by model system differences. Finally, Striedter argues for a "big tent" biology, in which a diverse set of models and research strategies can coexist productively.

This volume is a collection of papers assembled to honor Hiroya Kawanabe, an eminent Japanese ecologist who studied fishes and other organisms. Kawanabe retired from his position as Professor at Kyoto University in March 1996. In the first section of the volume his career is highlighted by a biography describing his life and work, a bibliography of his more than 750 lifetime publications, and a personal interview with a colleague who has been close to his work throughout his career. Papers in the second section of the volume include invited reviews of research on fish ecology in Japan, a historical overview of freshwater fishes of Japan, and recent studies on sex change among reef fishes. The 24 papers in the third section of the volume by Japanese fish biologists and their collaborators cover a wide variety of topics on fish biology. These include papers on evolution, genetics, systematics, reproductive biology, early life history, life history variation, behavior, physiology, ecology, and zoogeography. These papers address fishes from lentic, lotic, and marine ecosystems in Japan, Asia, Africa, North America, and in some cases worldwide. One of Hiroya Kawanabe's most brilliant and lasting contributions was to foster collaboration between Japanese ecologists and other scientists.

General Catalogue
Degrees in the Biological and Physical Sciences
University Curricula in the Marine Sciences and Related Fields
Edible Sea Urchins: Biology and Ecology
Energy, Mass and Information Transfer

This volume offers a comprehensive history of the Mount Desert Island Biological Laboratory (MDIBL), one of the major marine laboratories in the United States and a leader in using marine organisms to study fundamental physiological concepts. Beginning with its founding as the Harpswell Laboratory of Tufts University in 1898, David H. Evans follows its evolution from a teaching facility to a research center for distinguished renal and epithelial physiologists. He also describes how it became the site of major advances in cytokinesis, regeneration, cardiac and vascular physiology, hepatic physiology, endocrinology and toxicology, as well as studies of the comparative physiology of marine organisms. Fundamental physiological concepts in the context of the discoveries made at the MDIBL are explained and the social and administrative history of this renowned facility is described.

Catalogue of the University of Utah

Courses of Instruction
Perspectives from Scientists and Philosophers
Learning Assessment Techniques
Fish biology in Japan: an anthology in honour of Hiroya Kawanabe
Glycoscience: Chemistry and Chemical Biology I – III