Recent Advances And Issues In Biology

#biology #recent advances in biology #current issues in biology #biological research #biology challenges

Explore the dynamic landscape of biological science, encompassing the most significant recent advances across various fields. This overview also delves into the critical current issues in biology, examining the challenges and opportunities shaping the future of biological research and our understanding of life itself.

Recent Advances and Issues in Biology

This book covers recent advances in biology within the past 4 years. Biologist and veteran science writer Leslie A. Mertz covers the past five years of advances in biology in this cutting-edge reference. Topics covered include biodiversity, ecosystem management and sustainable development, evolution, molecular biology, and genetics. Annotation. Emphasizing documents from the last three years, this reference portrays the field both as an area of knowledge and as a profession. It discusses current issues like biodiversity, global warming, and genetic engineering, focusing on recent controversies and new research. And, it offers a sketch of the profession, including brief biographies of important contemporary biologists. Mertz is a field biologist and author.

Advances in Biological Science Research

Advances in Biological Science Research: A Practical Approach provides discussions on diverse research topics and methods in the biological sciences in a single platform. This book provides the latest technologies, advanced methods, and untapped research areas involved in diverse fields of biological science research such as bioinformatics, proteomics, microbiology, medicinal chemistry, and marine science. Each chapter is written by renowned researchers in their respective fields of biosciences and includes future advancements in life science research. Discusses various research topics and methods in the biological sciences in a single platform Comprises the latest updates in advanced research techniques, protocols, and methods in biological sciences Incorporates the fundamentals, advanced instruments, and applications of life science experiments Offers troubleshooting for many common problems faced while performing research experiments

Scientific Frontiers in Developmental Toxicology and Risk Assessment

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.

A New Biology for the 21st Century

Now more than ever, biology has the potential to contribute practical solutions to many of the major challenges confronting the United States and the world. A New Biology for the 21st Century recommends that a "New Biology" approach-one that depends on greater integration within biology, and closer collaboration with physical, computational, and earth scientists, mathematicians and engineers-be used to find solutions to four key societal needs: sustainable food production, ecosystem restoration, optimized biofuel production, and improvement in human health. The approach calls for a coordinated effort to leverage resources across the federal, private, and academic sectors to help meet challenges and improve the return on life science research in general.

Recent Advances in Biological Network Analysis

This book reviews recent advances in the emerging field of computational network biology with special emphasis on comparative network analysis and network module detection. The chapters in this volume are contributed by leading international researchers in computational network biology and offer in-depth insight on the latest techniques in network alignment, network clustering, and network module detection. Chapters discuss the advantages of the respective techniques and present the current challenges and open problems in the field. Recent Advances in Biological Network Analysis: Comparative Network Analysis and Network Module Detection will serve as a great resource for graduate students, academics, and researchers who are currently working in areas relevant to computational network biology or wish to learn more about the field. Data scientists whose work involves the analysis of graphs, networks, and other types of data with topological structure or relations can also benefit from the book's insights.

Biotechnology of Extremophiles:

Aimed at research scientists and biotechnologists, this book is an essential reading for those working with extremophiles and their potential biotechnological application. Here, we provide a comprehensive and reliable source of information on the recent advances and challenges in different aspects of the theme. Written in an accessible language, the book is also a recommended as reference text for anyone interested in this thriving field of research. Over the last decades, the study of extremophiles has provided ground breaking discoveries that challenge our understanding of biochemistry and molecular biology. In the applied side, extremophiles and their enzymes have spawned a multibillion dollar biotechnology industry, with applications spanning biomedical, pharmaceutical, industrial, environmental, and agricultural sectors. Taq DNA polymerase (which was isolated from Thermus aquaticus from a geothermal spring in Yellowstone National Park) is the most well-known example of the potential biotechnological application of extremophiles and their biomolecules. Indeed, the application of extremophiles and their biologically active compounds has opened a new era in biotechnology. However, despite the latest advances, we are just in the beginning of exploring the biotechnological potentials of extremophiles.

Recent Advances on Mycorrhizal Fungi

Recent Advances on Mycorrhizal Fungi integrates work done by pre-eminent scientists, academics, and researchers dedicated to the study of mycorrhizas in laboratories around the world. The main aim of this book is to compile the information related to mycorrhizas advancement and their applications. First, an overview of the recent advances in mycorrhizal fungi is fully examined. Then, researchers from different countries address issues related to semiarid, xeric, and agro-ecosystems. A greater understanding of the ecology of this type of fungi will underpin efforts to provide new strategies for

agriculture production systems and environmental solutions. Finally, relevant topics such as plant stress and ecological succession with regard to mycorrhizal symbioses are discussed. This book will be useful to those who work with mycorrhizas and important for academic and research teams, as well as to teachers, students, professionals and farmers. This information will be a key foundation to decision-makers worldwide and also for conservationists and ecologists.

Opportunities in Biology

Biology has entered an era in which interdisciplinary cooperation is at an all-time high, practical applications follow basic discoveries more quickly than ever before, and new technologiesâ€"recombinant DNA, scanning tunneling microscopes, and moreâ€"are revolutionizing the way science is conducted. The potential for scientific breakthroughs with significant implications for society has never been greater. Opportunities in Biology reports on the state of the new biology, taking a detailed look at the disciplines of biology; examining the advances made in medicine, agriculture, and other fields; and pointing out promising research opportunities. Authored by an expert panel representing a variety of viewpoints, this volume also offers recommendations on how to meet the infrastructure needsâ€"for funding, effective information systems, and other supportâ€"of future biology research. Exploring what has been accomplished and what is on the horizon, Opportunities in Biology is an indispensable resource for students, teachers, and researchers in all subdisciplines of biology as well as for research administrators and those in funding agencies.

Minorities and Small Numbers from Molecules to Organisms in Biology

This book provides an accessible introduction to an exciting new field of life science in which the focus is on small numbers of molecules and minorities within cell populations and their significance for the understanding of biological phenomena. Numbers, or quantitative data, are attracting more attention in cell biology following, for example, determination of the absolute copy number of each protein species in each bacterial cell and the recognition of leader cells that drive collective cell migration. Within this context, the authors present recent advances in experimental techniques, biological findings, and theories. A variety of cutting-edge topics and issues are addressed, with explanation of the ways in which recent developments in the field cast light on seemingly straightforward but difficult-to-answer questions. Readers will learn that we are on the verge of a paradigm shift as the importance of cooperation among groups of molecules in live cells is acknowledged. The book is designed to be enjoyable to read and easy to understand. It will be of interest for a wide range of readers, including young researchers and undergraduate/high school students.

Recent Advances in Microbiology

Micro-organisms are highly ubiquitous in nature and manifold in their activity. Interest in microbiology increased quite significantly due to wide application of micro-organisms in studying different biological processes. An attempt has been made to introduce the readers to several areas of microbiology and microbial biotechnology and to provide insight into basic concepts of biology and practical applications of micro-organisms. To assist the readers in understanding the text, several illustrations and figures have been incorporated in the current volume. The topics covered in this volume are arranged in such a way as to maintain the thread of continuity with Volume One as well as to make it easy for those who are not acquainted with Volume One of the series. The editors believe that the previous book of the series, Recent Advances in Microbiology Volume-1, would also be helpful to readers in strengthening their concepts about different areas of microbiology and microbial biotechnology.

Systems and Synthetic Biology

This textbook has been conceptualized to provide a detailed description of the various aspects of Systems and Synthetic Biology, keeping the requirements of M.Sc. and Ph.D. students in mind. Also, it is hoped that this book will mentor young scientists who are willing to contribute to this area but do not know from where to begin. The book has been divided into two sections. The first section will deal with systems biology – in terms of the foundational understanding, highlighting issues in biological complexity, methods of analysis and various aspects of modelling. The second section deals with the engineering concepts, design strategies of the biological systems ranging from simple DNA/RNA fragments, switches and oscillators, molecular pathways to a complete synthetic cell will be described. Finally, the book will offer expert opinions in legal, safety, security and social issues to present a well-balanced information both for students and scientists.

Beyond the Molecular Frontier

Chemistry and chemical engineering have changed significantly in the last decade. They have broadened their scopeâ€"into biology, nanotechnology, materials science, computation, and advanced methods of process systems engineering and controlâ€"so much that the programs in most chemistry and chemical engineering departments now barely resemble the classical notion of chemistry. Beyond the Molecular Frontier brings together research, discovery, and invention across the entire spectrum of the chemical sciencesâ€"from fundamental, molecular-level chemistry to large-scale chemical processing technology. This reflects the way the field has evolved, the synergy at universities between research and education in chemistry and chemical engineering, and the way chemists and chemical engineers work together in industry. The astonishing developments in science and engineering during the 20th century have made it possible to dream of new goals that might previously have been considered unthinkable. This book identifies the key opportunities and challenges for the chemical sciences, from basic research to societal needs and from terrorism defense to environmental protection, and it looks at the ways in which chemists and chemical engineers can work together to contribute to an improved future.

The Science of Life

Excerpt from The Science of Life: An Outline of the History of Biology and Its Recent Advances This little book bears a big title - The Science of Life - which is synonymous with Biology. Such a title would be unjustifiable did not the position of the book in the Victorian Era Series show that it is intended simply as a historical sketch of the evolution of the science, especially in Darwinian and post-Darwinian days. It is an attempt to illustrate the growth of Biology from an embryonic state of insignificance to a position which is central among the sciences, and full of influence even on the art of life. By reference to particular problems, and occasionally by reference to particular men, I have tried to illustrate impartially what may be called the modern biological attitude. In most of the chapters I have begun the story before the Victorian Era; it did not seem possible to understand the historical position without so doing. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Recent Advances in Cytometry

Cytometry is one of the most rapidly growing methodologies available for basic cell and molecular biology, cytogenetics, immunology, oncology, environmental sciences and also various fields of clinical medicine. This new edition, split into 2 Parts, is an almost completely new book, with nearly all of the chapters devoted to new topics. Like the previous volumes on cytometry published as part of the Methods in Cell Biology series, it provides a comprehensive description of particular cytometric methods and reviews their applications. Chapters present the theoretical foundations of the described methods, their applicability in experimental laboratory and clinical settings, and describes common traps and pitfalls such as problems with data interpretation, comparison with alternative assays, and choosing the optimal assay. * Comprehensive presentation of cytometric methods covering theoretical

applications, applicability, potential pitfalls, and comparisions to alternative assays * Discusses many new assays developed since the previous edition * Presents recent developments in cytometric intrumentation/technology.

Recent Advances in Scar Biology

This book is a printed edition of the Special Issue "Recent Advances in Scar Biology" that was published in IJMS

Grand Challenges in Marine Biotechnology

This book serves as essential reading for research scientists and biotechnologists from both academia and industry working in marine biotechnology and related disciplines. The book discusses recent advances and challenges in terms of science, technology, innovation, and policy for the development of the field; and how marine biotechnology may provide new solutions to some of the grand challenges faced by our society. Written in an accessible language, the book is also recommended as a reference text for decision-makers in government and non-governmental organizations in their efforts to foster the development of a global blue economy. With less than 5 % of the vast and rich marine environment explored, our seas and oceans represent a virtually unexplored resource for the discovery of novel product, processes, and development of bio-inspired synthetic drugs with biotechnological potential. As such, the marine environment has been considered Earth's last frontier of exploration. Recent advances in molecular techniques are providing the necessary tools to access on a larger scale the still-untapped ocean resources and, consequently, unveil the promise of the blue biotechnology. Governments are recognizing the potential of marine biotechnology to provide solutions to some of the Grand Challenges of the 21st Century such as sustainable energy and food sources, identification of novel drugs for improved health treatments, and providing new industrial materials and processes. For this reason, advances in marine biotechnology may foster the much-needed source of innovation and economic growth in many countries, and pave the way towards the development of a global blue economy, i.e. a new economic model based on the sustainable exploration of our ocean ecosystems.

Advances in Artificial Intelligence, Computation, and Data Science

Artificial intelligence (AI) has become pervasive in most areas of research and applications. While computation can significantly reduce mental efforts for complex problem solving, effective computer algorithms allow continuous improvement of AI tools to handle complexity—in both time and memory requirements—for machine learning in large datasets. Meanwhile, data science is an evolving scientific discipline that strives to overcome the hindrance of traditional skills that are too limited to enable scientific discovery when leveraging research outcomes. Solutions to many problems in medicine and life science, which cannot be answered by these conventional approaches, are urgently needed for society. This edited book attempts to report recent advances in the complementary domains of AI, computation, and data science with applications in medicine and life science. The benefits to the reader are manifold as researchers from similar or different fields can be aware of advanced developments and novel applications that can be useful for either immediate implementations or future scientific pursuit. Features: Considers recent advances in AI, computation, and data science for solving complex problems in medicine, physiology, biology, chemistry, and biochemistry Provides recent developments in three evolving key areas and their complementary combinations: AI, computation, and data science Reports on applications in medicine and physiology, including cancer, neuroscience, and digital pathology Examines applications in life science, including systems biology, biochemistry, and even food technology This unique book, representing research from a team of international contributors, has not only real utility in academia for those in the medical and life sciences communities, but also a much wider readership from industry, science, and other areas of technology and education.

Biosensors – Recent Advances and Future Challenges

The present book is devoted to all aspects of biosensing in a very broad definition, including, but not limited to, biomolecular composition used in biosensors (e.g., biocatalytic enzymes, DNAzymes, abiotic nanospecies with biocatalytic features, bioreceptors, DNA/RNA, aptasensors, etc.), physical signal transduction mechanisms (e.g., electrochemical, optical, magnetic, etc.), engineering of different biosensing platforms, operation of biosensors in vitro and in vivo (implantable or wearable devices), self-powered biosensors, etc. The biosensors can be represented with analogue devices measuring concentrations of analytes and binary devices operating in the YES/NO format, possibly with logical

processing of input signals. Furthermore, the book is aimed at attracting young scientists and introducing them to the field, while providing newcomers with an enormous collection of literature references.

Recent Advances in Industrial Biochemistry

Biochemistry is concerned with the chemical processes that occur within living organisms and microorganisms. There have been a number of publications focusing on biochemistry and its use for understanding biochemical and molecular mechanisms, with the majority of the literature focusing on bench scale items. To date there has not been a comprehensive work focusing on the techno-economic and industrial aspects of biochemistry from the microeconomic and pilot scales. This text covers current innovations and advances in plant biochemistry, animal biochemistry, microbial biochemistry and medicinal biochemistry plus potential uses of proteomics, genomics, recombinant DNA technology and protein application. Recent Advances in Industrial Biochemistry focuses on methods for recombinant proteins production and purification plus metabolic engineering and other source technologies from the industrial viewpoint, providing comprehensive, up-to-date information and evidence on contemporary development in the field of industrial biochemistry. The major focus of this book is the key issues, opportunities, approaches, advancements, products, innovations and technologies in current biochemistry from micro scale to production at pilot scale. Chapters highlight the many potential commercial prospects in various industries from food to to pharmaceuticals to bioenergy, providing a valuable and unique single resource for researchers.

Toward Precision Medicine

Motivated by the explosion of molecular data on humans-particularly data associated with individual patients-and the sense that there are large, as-yet-untapped opportunities to use this data to improve health outcomes, Toward Precision Medicine explores the feasibility and need for "a new taxonomy of human disease based on molecular biology" and develops a potential framework for creating one. The book says that a new data network that integrates emerging research on the molecular makeup of diseases with clinical data on individual patients could drive the development of a more accurate classification of diseases and ultimately enhance diagnosis and treatment. The "new taxonomy" that emerges would define diseases by their underlying molecular causes and other factors in addition to their traditional physical signs and symptoms. The book adds that the new data network could also improve biomedical research by enabling scientists to access patients' information during treatment while still protecting their rights. This would allow the marriage of molecular research and clinical data at the point of care, as opposed to research information continuing to reside primarily in academia. Toward Precision Medicine notes that moving toward individualized medicine requires that researchers and health care providers have access to very large sets of health- and disease-related data linked to individual patients. These data are also critical for developing the information commons, the knowledge network of disease, and ultimately the new taxonomy.

About Life

This book uses modern biological knowledge to tackle the question of what distinguishes living organisms from the non-living world. The authors first draw on recent advances in cell and molecular biology to develop an account of the living state that applies to all organisms (and only to organisms). This account is then used to explore questions about evolution, the origin of life, and the possibility of extraterrestrial life. The novel approach taken by this book to issues in biology will interest and be accessible to both the general reader as well as students and specialists in the field.

New Advances and Contributions to Fish Biology

This book provides an understanding on a large variety of related topics in fish biology. The further development on molecular and cellular biology and ecology leads to assimilate the newer scientific knowledge in this area. Leading research works from around the world are brought together in this book to produce a valuable source of reference for teachers, researcher, and advanced students of biological science. The fist three chapters of this book give a general description of the complex biology of the immune response. Detailed descriptions were also included on understanding of cytokine regulation in teleost immune system. The second three chapters provide information on the environmental stressors on the responses of freshwater fish across molecular to population level. Then, the following two chapters review two special topics; the roles of the atrium and the ventricle across teleost species

and the tracer methodologies on the measurements of carbohydrate metabolism. The last chapter discusses the variables that are involved in the feeding behavior of a predatory freshwater fish species.

Globalization, Biosecurity, and the Future of the Life Sciences

Biomedical advances have made it possible to identify and manipulate features of living organisms in useful ways-leading to improvements in public health, agriculture, and other areas. The globalization of scientific and technical expertise also means that many scientists and other individuals around the world are generating breakthroughs in the life sciences and related technologies. The risks posed by bioterrorism and the proliferation of biological weapons capabilities have increased concern about how the rapid advances in genetic engineering and biotechnology could enable the production of biological weapons with unique and unpredictable characteristics. Globalization, Biosecurity, and the Future of Life Sciences examines current trends and future objectives of research in public health, life sciences, and biomedical science that contain applications relevant to developments in biological weapons 5 to 10 years into the future and ways to anticipate, identify, and mitigate these dangers.

Barley Science

Find up-to-date information on barley for malting, food, and animal feed! This comprehensive book covers every aspect of barley from molecular biology to agronomy of yield and quality. In addition to the exposition of the basic concepts, Barley Science explains the latest developments in the field. In addition, this remarkable book presents ideas and techniques for bridging the gap between physiology and breeding. Beginning with the history of this ancient cultivated grain, Barley Science presents state-of-the-art information on genetics and breeding, physiology, and agronomy. One chapter explains the CERES computer simulation of barley growth, development, and yield. Every chapter includes a thorough literature review, and you will find many helpful tables and figures. Barley Science offers cutting-edge information on the latest developments in the field, including: wild barley as a source of genes for crop improvement genetics and breeding for specific attributes genetic engineering determining barley yield under stress new breeding strategies for disease resistance choosing genotype, sowing date, and plant density for malting barley enhancing pre-harvest sprouting resistance barley proteins and malting performance Written by the top experts in the field, Barley Science is an excellent update and broadening of the information found in previous barley books. Agronomists, breeders, geneticists, and physiologists--and their students--will turn again and again to this essential resource.

Recent Advances in Biophoton Research and Its Applications

Biophoton emission now belongs to a topical field of modern science: It concerns a weak light emision from biological systems. Such molecular events are clearly compatible with collective phenomena as shown by recent developments in the life sciences such as the chaos theory. This book is concerned with the ?optical window? of biological interactions and in view of their correlations to many biological functions they provide a powerful, non-invasive tool of analysing biological systems. Topics include food science, pollution, efficacy of drugs including the treatment of cancer and immune diseases, and communication phenomena such as consciousness.The collection of articles in this book covers the historical background, the physics of biophoton emission, those biological phenomena which show evidence of a ?holistic? character, and finally discusses applications and biological evolution. This volume serves to bring researchers up-to-date on the subject and draws attention to the many exciting findings that are widely scattered in the scientific literature.

Nanotechnology in Biology and Medicine

Nanotechnology in biology and medicine: Research advancements & future perspectives is focused to provide an interdisciplinary, integrative overview on the developments made in nanotechnology till date along with the ongoing trends and the future prospects. It presents the basics, fundamental results/current applications and latest achievements on nanobiotechnological researches worldwide scientific era. One of the major goals of this book is to highlight the multifaceted issues on or surrounding of nanotechnology on the basis of case studies, academic and theoretical articles, technology transfer (patents and copyrights), innovation, economics and policy management. Moreover, a large variety of nanobio-analytical methods are presented as a core asset to the early career researchers. This book has been designed for scientists, academician, students and entrepreneurs engaged in nanotechnology research and development. Nonetheless, it should be of interest to a variety of scientific disciplines including agriculture, medicine, drug and food material sciences and

consumer products. Features It provides a thoroughly comprehensive overview of all major aspects of nanobiotechnology, considering the technology, applications, and socio-economic context It integrates physics, biology, and chemistry of nanosystems It reflects the state-of-the-art in nanotechnological research (biomedical, food, agriculture) It presents the application of nanotechnology in biomedical field including diagnostics and therapeutics (drug discovery, screening and delivery) It also discusses research involving gene therapy, cancer nanotheranostics, nano sensors, lab-on-a-chip techniques, etc. It provides the information about health risks of nanotechnology and potential remedies. It offers a timely forum for peer-reviewed research with extensive references within each chapter

Advances in Seed Biology

The seed plays a fundamental role in plant reproduction as well as a key source of energy, nutrients and raw materials for developing and sustaining humanity. With an expanding and generally more affluent world population projected to reach nine billion by mid-century, coupled to diminishing availability of inputs, agriculture is facing increasing challenges to ensure sufficient grain production. A deeper understanding of seed development, evolution and physiology will undoubtedly provide a fundamental basis to improve plant breeding practices and ultimately crop yields. Recent advances in genetic, biochemical, molecular and physiological research, mostly brought about by the deployment of novel high-throughput and high-sensitivity technologies, have begun to uncover and connect the molecular networks that control and integrate different aspects of seed development and help determine the economic value of grain crops with unprecedented details. The objective of this e-book is to provide a compilation of original research articles, reviews, hypotheses and perspectives that have recently been published in Frontiers in Plant Science, Plant Evolution and Development as part of the Research Topic entitled "Advances in Seed Biology". Editing this Research Topic has been an extremely interesting, educational and rewarding experience, and we sincerely thank all authors who contributed their expertise and in-depth knowledge of the different topics discussed. We hope that the information presented here will help to establish the state of the art of this field and will convey how exciting and important studying seeds is and hopefully will stimulate a new crop of scientists devoted to investigating the biology of seeds.

Advances in Computational Biology

The second volume in a series which aims to focus on advances in computational biology. This volume discusses such topics as: statistical analysis of protein sequences; progress in large-scale sequence analysis; and the architecture of loops in proteins.

High-School Biology Today and Tomorrow

Biology is where many of science's most exciting and relevant advances are taking place. Yet, many students leave school without having learned basic biology principles, and few are excited enough to continue in the sciences. Why is biology education failing? How can reform be accomplished? This book presents information and expert views from curriculum developers, teachers, and others, offering suggestions about major issues in biology education: what should we teach in biology and how should it be taught? How can we measure results? How should teachers be educated and certified? What obstacles are blocking reform?

Positioning Synthetic Biology to Meet the Challenges of the 21st Century

Synthetic biology -- unlike any research discipline that precedes it -- has the potential to bypass the less predictable process of evolution to usher in a new and dynamic way of working with living systems. Ultimately, synthetic biologists hope to design and build engineered biological systems with capabilities that do not exist in natural systems -- capabilities that may ultimately be used for applications in manufacturing, food production, and global health. Importantly, synthetic biology represents an area of science and engineering that raises technical, ethical, regulatory, security, biosafety, intellectual property, and other issues that will be resolved differently in different parts of the world. As a better understanding of the global synthetic biology landscape could lead to tremendous benefits, six academies -- the United Kingdom's Royal Society and Royal Academy of Engineering, the United States' National Academy of Sciences and National Academy of Engineering, and the Chinese Academy of Science and Chinese Academy of Engineering -- organized a series of international symposia on the scientific, technical, and policy issues associated with synthetic biology. Positioning Synthetic Biology to Meet the Challenges of the 21st Century summarizes the symposia proceedings.

Advances and Avenues in the Development of Novel Carriers for Bioactives and Biological Agents

Advances and Avenues in the Development of Novel Carriers for Bioactives and Biological Agents provides sound data on the utility of biological and plant-based drugs and describes challenges faced in all aspects offering indispensable strategies to use in the development of bioactive medicines. Bioactive based medications are commonly used throughout the world and have been recognized by physicians and patients for their therapeutic efficacy. Bioactive formulations, including their subordinates and analogs, address 50% of all medicines in clinical practice. Novel bioactive medicine transporters can cure many disorders by both spatial and transitory approaches and have various justifications in medicinal potential. This book presents information on the utility of natural, plant, animal and bioengineered bioactive materials. It is a fundamental source of information and data for pharmacognosists, pharmaceutical analysts, drug transport scientists and pharmacologists working in bioactive medications. Advances information on various bioactive based medications, their sources, clinical consequences and transport strategies Illustrates diverse transport systems for bioactives and derivatives, novel techniques for formulations, targeting strategies and fundamental qualities of developed bioactive carriers, and their safety concerns and standardization Discusses distinctive transport systems, stability, upgraded dissolvability, and enhanced bioavailability of bioactives

Polar Microbiology: Recent Advances and Future Perspectives

This book is a printed edition of the Special Issue "Polar Microbiology: Recent Advances and Future Perspectives" that was published in Biology

The Science of Life

Excerpt from The Science of Life: An Outline of the History of Biology and Its Recent Advances In most of the chapters I have begun the story before the Victorian Era; it did not seem possible to understand the historical position without so doing. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Molecular Zoology

Molecular Zoology Advances, Strategies, and Protocols Edited by Joan D. Ferraris and Stephen R. Palumbi Contemporary tools of molecular biology continue to open new areas of biological research and to provide important answers to classic problems. Zoological questions of mating strategies, physiological adaptation, genetic exchange between populations, cell lineages during development, and many others are now being powerfully addressed using tools from the molecular arsenal. To provide broad access to these tools requires an authoritative reference that highlights recent advances, lays out future strategies, and provides working protocols to a wide audience of zoological scientists. Molecular Zoology: Advances, Strategies, and Protocols outlines the core concepts of these critical molecular

techniques and provides specific instructions for their use. The book is divided into two main parts: Research Strategies and Protocols. The first section features detailed descriptions of the research approaches that incorporate molecular tools in the study of developmental, physiological, ecological, and evolutionary processes. In addition to charting recent advances, this section shows how to interpret results and describes the advantages and disadvantages of alternative approaches. These chapters function as entry points to molecular zoology for broadly trained zoologists without formal molecular training, graduate students, and molecular biologists in other fields. The second section is a compilation of over 60 protocols which have been developed, tested, and perfected by leading researchers in the field. It provides step-by-step coverage of each protocol, featuring for each a summary of its underlying rationale, a list of necessary reagents and solutions, and a discussion of potential obstacles to a particular technique. Specific techniques covered in the book include: * Applications of parametric bootstrapping in molecular phylogenetics * Microsatellite analysis of genetic mating systems and genetic relatedness * Use of RAPD-PCR markers in genetic structure and genealogies * PCR-based cloning across large taxonomic distances * Cell lineage analysis using retroviral vectors * Osmoregulatory gene characterization and expression * Regulatory element identification and transcription factor analysis * Protocols for in situ hybridization, DNA footprinting, gene knockout, ribonuclease protection assay, and coupled transcription/translation reactions. Molecular Zoology: Advances, Strategies, and Protocols is an authoritative resource designed to provide both basic and in-depth explanations of molecular investigation procedures for research scientists in all areas of organismal and integrative biology, including zoology, marine biology, and ecology. With its extensive coverage of molecular protocols, graduate students in biology will also find this book to be an indispensable manual for laboratory work.

Jellyfish Blooms: Causes, Consequences and Recent Advances

Jellyfish form spectacular population blooms and there is compelling evidence that jellyfish blooms are becoming more frequent and widespread. Blooms have enormous ecological, economic, and social impacts. For example, they have been implicated in the decline of commercial fisheries, they block the cooling water intakes of coastal industries and ships, and reduce the amenity of coastal waters for tourists. Blooms may be caused by overfishing, climate change, and coastal pollution, which all affect coastal waters around the world. Jellyfish Blooms: Causes, Consequences and Recent Advances presents reviews and original research articles written by the world’s leading experts on jellyfish. Topics covered include the evolution of jellyfish blooms, the impacts of climate change on jellyfish populations, advances in acoustic and molecular methods used to study jellyfish, the role of jellyfish in food webs and nutrient cycles, and the ecology of the benthic stages of the jellyfish life history. This is a valuable resource for students and professional marine biologists, fisheries scientists, oceanographers, and researchers of climate change.

Recent Advances in Plant Biotechnology

Plant biotechnology applies to three major areas of plants and their uses: (1) control of plant growth and development; (2) protection of plants against biotic and abiotic stresses; and (3) expansion of ways by which specialty foods, biochemicals, and pharmaceuticals are produced. The topic of recent advances in plant biotechnology is ripe for consideration because of the rapid developments in this ?eld that have revolutionized our concepts of sustainable food production, cost-effective alt- native energy strategies, environmental bioremediation, and production of pla- derived medicines through plant cell biotechnology. Many of the more traditional approaches to plant biotechnology are woefully out of date and even obsolete. Fresh approaches are therefore required. To this end, we have brought together a group of contributors who address the most recent advances in plant biotechnology and what they mean for human progress, and hopefully, a more sustainable future. Achievements today in plant biotechnology have already surpassed all previous expectations. These are based on promising accomplishments in the last several decades and the fact that plant biotechnology has emerged as an exciting area of research by creating unprecedented opportunities for the manipulation of biological systems. In connection with its recent advances, plant biotechnology now allows for the transfer of a greater variety of genetic information in a more precise, controlled manner. The potential for improving plant productivity and its proper use in agric- ture relies largely on newly developed DNA biotechnology and molecular markers.

Heredity and Eugenics

Excerpt from Heredity and Eugenics: A Course of Lectures Summarizing Recent Advances in Knowledge, in Variation, Heredity, and Evolution and Its Relation, to Plant, Animal, and Human Improvement Ment and Welfare During the summer of 1911, a course of lectures on heredity and allied topics was given at the University of Chicago, under the auspices of the biological departments. The purpose of the course was to present the recent developments of knowledge in reference to variation, heredity, and evolution, and the application of this new knowledge to plant, animal, and human development and improvement. The lectures were not intended for those trained in biology, but for a general university audience, interested in the progress of genetics as a matter of information rather than of study. The lecturers, therefore, did not address themselves to their colleagues, and did not attempt to include any considerable amount of new material. It is believed that a much larger audience than the one originally addressed might be interested in this summary of results in one of the important and recently cultivated fields of biology, and therefore this volume has been published. It is hoped that it may perform a service not only for those interested in biology as a field outside their own experience, but also for those biologists whose work deals with other phases of biology. The lectures were given by five lecturers, with no opportunity to relate the lectures to one another other than as suggested by the assigned titles. It is inevitable that there should be more or less overlapping of statements, and no attempt has been made to avoid this. Each lecture, therefore, is complete in itself, as it was delivered. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Chembiomolecular Science

At the forefront of life sciences today is the emerging discipline of chembiomolecular science. This new term describes the integration of the frontier fields of chemical biology, chemistry, and pharmacology. Chembiomolecular science aims to elucidate new biological mechanisms as potential drug targets and enhance the creation of new drug therapies. This book comprises the proceedings of the Uehara Memorial Foundation Symposium 2011, which focused on the most recent advances in chembiomolecular science made by leading experts in the field. The book is divided into three main topics. The first is the chemical approach to understanding complex biological systems on a molecular level using chemical compounds as a probe. The second describes the biological approach used to develop new lead drug compounds. The third focuses on the biological system that serves as the potential drug target, the beginning step in the process of developing new drugs. Replete with the latest research, the book will draw the attention of all scientists interested in the synergies between chemistry and biology to elucidate life on a molecular level and to promote drug discovery. Ultimately, the book helps promote the understanding of biological functions at the molecular level and create new pharmaceuticals that can contribute to improving human health.

The Biology of Glial Cells: Recent Advances

This book reviews the role of glial cells (astrocytes, microglia, oligodendroglia, satellite cells, and Schwann cells) in neuronal health and diseases. It discusses the latest advances in understanding their origin, differentiation, and hemostasis. The book also examines the role of microglial cells in central nervous system (CNS) development, maintenance, and synaptic plasticity. Further, the book presents the functions of astrocytes in healthy CNS and their critical role in CNS disorders, including Parkinson's and Alzheimer's diseases. Notably, the book describes the pathobiology, molecular pathogenesis, stem cells, and imaging characteristics of gliomas. It defines the role of glial cells in regulating iron homeostasis and their effect on the neurodegeneration of neurons. Lastly, it covers the structure, function, and pathology of oligodendrocytes and their role in neuronal health and disease.

Molecular Farming in Plants: Recent Advances and Future Prospects

Molecular farming in plants is a relatively young subject of sciences. As plants can offer an inexpensive and convenient platform for the large-scale production of recombinant proteins with various functions, the driven force from the giant market for recombinant protein pharmaceuticals and industrial enzymes makes this subject grow and advance very quickly. To summarize recent advances, current challenges

and future directions in molecular farming, international authorities were invited to write this book for researchers, teachers and students who are interested in this subject. This book, with the focus on the most advanced cutting-edge breakthroughs, covers all the essential aspects of the field of molecular farming in plants: from expression technologies to downstream processing, from products to safety issues, and from current advances and holdups to future developments.