

# Animal Biotechnology Models In Discovery And Translation

Plant pathogens, the causal agent of infectious plant diseases, influence our lives more than just as an economic impact through yield lost. The study of plant pathogens has given rise to the development of new sciences, new technologies for plant breeding, and the agrochemical industry for pesticide developments. Yet, all our actions and efforts to suppress or eradicate them constantly pressures these various organisms to evolve and adapt for survival. Therefore today, when facing climate changes, accelerated transport of plants and plant products, and world population growth, we have to ask *quo vadis* phytopathology. Like Alice in Wonderland "If we wish to go anywhere we must run twice as fast as that" so we need to constantly broaden our knowledge. However, today's literature abounds with knowledge about plant pathogens. Hence, this book intends to present to the reader all the latest material and knowledge about plant pathogens, changes or refinements in plant disease epidemiology, and new approaches and materials used for plant pathogen control. Hopefully, this book will be of interest to those working within the field and looking for an up-to-date introduction. We hope it also interests students and thereby, will influence the future development of phytopathology and our better coexistence with plant pathogens.

*Social Aspects of Drug Discovery, Development and Commercialization* provides an insightful analysis of the drug discovery and development landscape as it relates to society. This book examines the scientific, legal, philosophical, economic, political, ethical and cultural factors that contribute to drug development. The pharmaceutical industry is under scrutiny to develop safer and more effective drugs in a quicker and more affordable manner. Recent criticism and debates have emphasized varying opinions on the issues concerning the drug discovery and development process. This book provides thoughtful and valuable discussions and analysis of the social challenges and potential opportunities through all stages of the pharmaceutical process, from inception through marketing. With a unique focus on the social factors that increasingly play a role in how drug development is planned, structured, and executed throughout the drug product lifecycle, this is an essential resource for students, professors, and researchers who seek a better understanding of the interface between the pharmaceutical industry, health care systems, and society.

Organized in a sequence of interrelated theories and principles that provide the foundation for increased understanding of the relevant social aspects. Includes analysis of important new advances, key scientific and strategic issues, and overviews of recent progress in drug development. Provides a global perspective with examples from developed areas, such as the US, Japan, Canada and Europe, as well as faster-growing and emerging economies including Brazil,

Russia, India, and China Serves as an essential resource for students, professors, and researchers who seek a better understanding of the interface between the pharmaceutical industry, health care systems, and society. The world has recorded losses in terms of human life as well as extensive time spent in experimentation with development of new drugs, elucidation of disease mechanism(s), and therapeutic agent discovery. Ethical and legal issues cojoin in slowing down scientific discoveries in medicine and biology. The past two (2) decades, therefore, have seen tremendous attempts that largely are successful in developing animal models with the characteristics of mimicking, approximating or expressing transplanted human organs/tissues. These models or rather approaches seem to be fast, cost-effective, and easy to maintain compared to primates. This book is a collection of expert essays on animal models of human diseases of global interest. A visible objective of the book is to provide real-time experimental approach to scientists, clinicians, ethicists, medicolegal/medical jurisprudence workers, immunologists, postgraduate students, and vaccinologists and informative and multidisciplinary approach for the identification of new therapeutic targets and biomarkers using animal models as well as investigating the pathogenesis and therapeutic strategies of human diseases. An increased understanding of the genetic, molecular, and cellular mechanisms responsible for the development of human diseases has laid out the foundation for the development of rational therapies mainly with animal models.

Much research has focused on the basic cellular and molecular biological aspects of stem cells. Much of this research has been fueled by their potential use in regenerative medicine applications, which has in turn spurred growing numbers of translational and clinical studies. However, more work is needed if the potential is to be realized for improvement of the lives and well-being of patients with numerous diseases and conditions. This book series 'Cell Biology and Translational Medicine (CBTMED)' as part of SpringerNature's longstanding and very successful Advances in Experimental Medicine and Biology book series, has the goal to accelerate advances by timely information exchange. Emerging areas of regenerative medicine and translational aspects of stem cells are covered in each volume. Outstanding researchers are recruited to highlight developments and remaining challenges in both the basic research and clinical arenas. This current book is the ninth volume of a continuing series.

An Effective Therapeutic Strategy

Genomics and Biotechnological Advances in Veterinary, Poultry, and Fisheries

Nanotechnology in the Beverage Industry

Cis/Transgene Optimization

Trademarks

Heavy Metal and Metalloid Contamination of Surface and Underground Water

Bionanotechnology

*Refinement in sequencing technologies and potential of genomic research resulted in meteoric growth of biological*

information such as sequences of DNA, RNA and protein requiring databases for efficient storage, management and retrieval of the biological information. Also, computational algorithms for analysis of these colossal data became a vital aspect of biological sciences. The work aims to show the process of turning bioscience innovation into companies and products, covering the basic science, the translation of science into technology. Due to rapid developments, there seems to be no basic difference between the pharmaceutical industry and the biotechnological industry. However, approved products in the pipeline and renewed public confidence make it one of the most promising areas of economic growth in the near future. India offers a huge market for the products as well as cheap manufacturing base for export. The book is a sincere work of compilation of new and recent advances in the topic of concern through various innovative researches and scientific opinion therefrom. The book is dedicated to the readers who will definitely find it interesting and knowledgeable in carrying out their respective researches in different aspects of applied microbiology and biotechnology.

*Animal Biotechnology: Models in Discovery and Translation, Second Edition*, provides a helpful guide to anyone seeking a thorough review of animal biotechnology and its application to human disease and welfare. This updated edition covers vital fundamentals, including animal cell cultures, genome sequencing analysis, epigenetics and animal models, gene expression, and ethics and safety concerns, along with in-depth examples of implications for human health and prospects for the future. New chapters cover animal biotechnology as applied to various disease types and research areas, including in vitro fertilization, human embryonic stem cell research, biosensors, enteric diseases, biopharming, organ transplantation, tuberculosis, neurodegenerative disorders, and more. Highlights the latest biomedical applications of genetically modified and cloned animals, with a focus on cancer and infectious diseases Offers first-hand accounts of the use of biotechnology tools, including molecular markers, stem cells, animal cultures, tissue engineering, ADME and CAM Assay Includes case studies that illustrate safety assessment issues, ethical considerations, and intellectual property rights associated with the translation of animal

*biotechnology studies*

*Nanosensors for Smart Agriculture covers new breakthroughs in smart agriculture, highlighting new technologies, such as the internet of things, big data and artificial intelligence. In addition, the book provides the many advantages of nanosensors over their micro counterparts, such as lower power consumption, higher sensitivity, lower concentration of analytes, and smaller interaction distances between the object and sensor. Sections provide information on fundamental design concepts and emerging applications of nanosensors in smart agriculture. The book highlights how, when cultivating soil, nanosensors and their wireless networks can be used for soil quality monitoring (moisture/herbicides/organic compound/trace metals monitoring in soil, etc. Other applications cover how smart nanosensors can be used for virus detection and hygiene/pathogen controls in livestock, their use as active transport tracking devices for smart tracking and tracing, and other various applications, such as (i) nanochips for identity (radio frequency identification), (ii) food inspection, (iii) intelligent food packaging, and (iv) smart storage. This is an important reference source for materials scientists and agricultural engineers who are looking to understand more about how nanosensor technology can be used to create more efficient and sustainable agricultural systems. Outlines the fabrication and fundamental design concepts of nanosensors for agricultural applications Explains how nanosensors are being used throughout the agricultural cycle – from crop growth to food manufacturing Assesses major challenges surrounding the application of nanosensors to agricultural applications in mass scale*

*This book entitled, “Advances in Animal Biotechnology,” is a compilation of state-of-the-art in the field of Animal Biotechnology including fishery, that are not sheltered in depth in earlier publications. It offers an update on avant-garde technologies and advances in key aspects of genetic engineering, metagenomics, assisted reproduction, animal genomics, biotechnology in veterinary health, as well as the role of gut and marine microbial ecosystems in livestock and industrial development. The book is divided broadly into five different sections, viz., Gut Microbiome and Nutritional Biotechnology, Assisted Reproduction*

*Biotechnology, Livestock Genomics, Health Biotechnology, and Animal Biotechnology in Global Perspective.* The book covers the syllabi of Animal Biotechnology courses in various universities, academia and competitive examinations at various levels. Researchers, Continuing Graduates, and Academicians, Research Institutions, and Biotech Companies will be benefited from this valuable compilation of research. Its broad spectrum makes this work a valuable resource for professionals, researchers, academics and students in the field of veterinary and animal production as well as the biotechnology industry.

*Social Aspects of Drug Discovery, Development and Commercialization*

*Oil Crop Genomics*

*Animal Cell Technology*

*Nanosensors for Smart Agriculture*

*Advances in Animal Biotechnology*

*Animal Experimentation*

*Encyclopedia of Marine Biotechnology*

*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 keystone reference that presents both up-to-date research and the far-reaching applications of marine biotechnology* Featuring contributions from 100 international experts in the field, this five-volume encyclopedia provides comprehensive coverage of topics in marine biotechnology. It starts with the history of the field and delivers a complete overview of marine biotechnology. It then offers information on marine organisms, bioprocess techniques, marine natural products, biomaterials, bioenergy, and algal biotechnology. The encyclopedia also covers marine food and biotechnology applications in areas such as pharmaceuticals, cosmeceuticals, and nutraceuticals. Each

*topic in Encyclopedia of Marine Biotechnology is followed by 10-30 subtopics. The reference looks at algae cosmetics, drugs, and fertilizers; biodiversity; chitins and chitosans; aeropylsinin-1, toluquinol, astaxanthin, and fucoxanthin; and algal and fish genomics. It examines neuro-protective compounds from marine microorganisms; potential uses and medical management of neurotoxic phycotoxins; and the role of metagenomics in exploring marine microbiomes. Other sections fully explore marine microbiology, pharmaceutical development, seafood science, and the new biotechnology tools that are being used in the field today. One of the first encyclopedic books to cater to experts in marine biotechnology Brings together a diverse range of research on marine biotechnology to bridge the gap between scientific research and the industrial arena Offers clear explanations accompanied by color illustrations of the techniques and applications discussed Contains studies of the applications of marine biotechnology in the field of biomedical sciences Edited by an experienced author with contributions from internationally recognized experts from around the globe Encyclopedia of Marine Biotechnology is a must-have resource for researchers, scientists, and marine biologists in the industry, as well as for students at the postgraduate and graduate level. It will also benefit companies focusing on marine biotechnology, pharmaceutical and biotechnology, and bioenergy.*

*The latest volume in the Advanced Biotechnology series provides an overview of the main product classes and platform chemicals produced by biotechnological processes today, with applications in the food, healthcare and fine chemical industries. Alongside the production of drugs and flavors as well as amino acids, bio-based monomers and polymers and biofuels, basic insights are also given as to the biotechnological processes yielding such products and how large-scale production may be enabled and improved. Of interest to biotechnologists, bio and chemical engineers, as well as those working in the biotechnological, chemical, and food industries.*

*The collection of systems represented in this volume is a unique effort to reflect the diversity and utility of models used in biomedicine. That utility is based on the consideration that observations made in particular organisms will provide insight into the workings of other, more complex systems. This volume is therefore a comprehensive and extensive collection of these important medical parallels.*

*Textbook of Animal Biotechnology*

*Environmental, Policy and Ethical Issues*

*Emerging Breeding Technologies*

*Industrial Biotechnology*

*Systematic Discovery of Novel Gene Expression Elements Using Bioinformatics and Computational Biology Approaches*

*Reproductive Biotechnologies*

*Animal Biotechnology*

Nanotechnology in the Beverage industry: Fundamentals and Applications looks at how nanotechnology is being used to enhance water quality, as well as how the properties of nanomaterials can be used to create different properties in both alcoholic and no-alcoholic drinks and enhance the biosafety of both drinks and their packaging. This is an important

reference for materials scientists, engineers, food scientists and microbiologists who want to learn more about how nanotechnology is being used to enhance beverage products. As active packaging technology, nanotechnology can increase shelf-life and maintain the quality of beverages. In the field of water treatment, nanomaterials offer new routes to address challenges. Describes the major properties that make nanomaterials good agents for increasing the purification of water and other beverages Outlines major nanoencapsulation techniques for use in a variety of beverage types Discusses the major challenges of using nanomaterials in both beverages and beverage packaging

Genomics and Biotechnological Advances in Veterinary, Poultry, and Fisheries is a comprehensive reference for animal biotechnologists, veterinary clinicians, fishery scientists, and anyone who needs to understand the latest advances in the field of next generation sequencing and genomic editing in animals and fish. This essential reference provides information on genomics and the advanced technologies used to enhance the production and management of farm and pet animals, commercial and non-commercial birds, and aquatic animals used for food and research purposes. This resource will help the animal biotechnology research community understand the latest knowledge and trends in this field. Presents biological applications of cattle, poultry, marine and animal pathogen genomics Discusses the relevance of biomarkers to improve farm animals and fishery Includes recent approaches in cloning and transgenic cattle, poultry and fish production

Wastewater Treatment Reactors: Microbial Community Structure analyzes microbial community structure in relation to changes in physico-chemical parameters, the gene content (metagenome) or gene expression (metatranscriptome) of microbial communities in relation to changes in physico-chemical parameters, physiological aspects of microbial communities, enrichment cultures or pure cultures of key species in relation to changes in physico-chemical parameters, and modeling of potential consequences of changes in microbial community structure or function for higher trophic levels in a given habitat. As several studies have been carried out to understand bulking phenomena and the importance of environmental factors on sludge settling characteristics, which are thought to be strongly influenced by flocculation, sludge bulking, foaming and rising, this book is an ideal resource on the topics covered. Presents the state-of-the-art techniques and applications of omics tools in wastewater treatment reactors (WWTRs) Describes both theoretical and practical knowledge surrounding the fundamental roles of microorganisms in WWTRs Points out the reuse of treated wastewater through emerging technologies Covers the economics of wastewater treatment and the development of suitable alternatives in terms of performance and cost effectiveness Discusses cutting-edge molecular biological tools Gives in-depth knowledge to study microbial community structure and function in wastewater treatment reactors

In order to grow replacement tissues, 3D scaffolds are widely used as a template for tissue engineering and regeneration. These scaffolds, which are typically 'seeded' with cells, support the growth of new tissues. However, in order to achieve successful tissue growth, the scaffold must meet specific requirements and are often 'functionalized' to accentuate particular properties. Functional 3D tissue engineering scaffolds: materials, technologies, and applications, is a comprehensive review of functional 3D scaffolds, providing information on the fundamentals, technologies, and applications. Part 1 focuses on the fundamentals of 3D tissue scaffolds, examining information on materials, properties, and trends. Part 2 discusses a wide range of conventional technologies for engineering functional 3D scaffolds, leading the way to a discussion on CAD and advanced technologies for functional 3D scaffold engineering. Chapters in part 3 study methods for functionalizing scaffolds to support a variety of in vivo functions whilst the final set of chapters provides an important review of the most significant applications of functional 3D scaffolds within tissue engineering. This book is a valuable resource for biomaterial scientists and biomedical engineers in academia and industry, with

interests in tissue engineering and regenerative medicine. Provides a self-contained work for the field of biomaterials and tissue engineering Discusses all the requirements a scaffold must meet and a wide range of strategies to create them Highlights significant and successful applications of functional 3D scaffolds

Models in Discovery and Translation

Sourcebook of Models for Biomedical Research

Functional 3D Tissue Engineering Scaffolds

Fundamentals and Applications

Scientific Facts and Fiction

Cell Biology and Translational Medicine, Volume 9

Animal Models in Toxicology

***This book deals with a subject of high interest and importance in all sectors, including biomedical, food, agriculture, energy, and environment. Biological systems are essential in nanotechnology, and many new applications are being developed by mimicking the natural systems. Approaching these topics from an engineering perspective, the book offers insight on the details of nanoscale fabrication processes as well as cell biology. The basics of biology and chemistry, with a focus on how to engineer the behavior of molecules at the nanoscale, are also explored and analyzed. The aim of the text is to provide the reader with broader knowledge of biological methods for signal transduction and molecular recognitions systems and how they can be replicated in bio-sensing applications. The reader will learn the basic structures and interactions of biomacromolecules for developing biocompatible and eco-friendly devices.***

***Scientific experiments using animals have contributed significantly to the improvement of human health. Animal experiments were crucial to the conquest of polio, for example, and they will undoubtedly be one of the keystones in AIDS research. However, some persons believe that the cost to the animals is often high. Authored by a committee of experts from various fields, this book discusses the benefits that have resulted from animal research, the scope of animal research today, the concerns of advocates of animal welfare, and the prospects for finding alternatives to animal use. The authors conclude with specific recommendations for more consistent government action. Genetic-based animal biotechnology has produced new food and pharmaceutical products and promises many more advances to benefit humankind. These exciting prospects are accompanied by considerable unease, however, about matters such as safety and ethics. This book identifies science-based and policy-related concerns about animal biotechnology—key issues that must be resolved before the new breakthroughs can reach their potential. The book includes a short history of the field and provides understandable definitions of terms like cloning. Looking at technologies on the near horizon, the authors discuss what we know and what we fear about their effects—the inadvertent release of dangerous microorganisms, the safety of products derived from biotechnology, the impact of genetically engineered animals on their environment. In addition to these concerns, the book explores animal welfare concerns, and our societal and institutional capacity to manage and regulate the technology and its products. This accessible volume will be important to everyone interested in the implications of the use of animal biotechnology.***

***Animal cell technology has undergone a rapid transformation over the last decade from a research tool and highly specialised technology to a central resource for innovation in pharmaceutical research and development. These proceedings of the 14th Meeting of the European Society for Animal Cell Technology (Vilamoura, Portugal, May 1996) bring up to date the historical perspective of animal cell technology for the benefit of society,***



*'From Vaccines to Genetic Medicine', and will charter this vital technology for the years to come. Strong contributions are grouped in the traditional ESACT areas of 'Cell and Physiology Engineering' dealing with cell state, including genetics, and its environment, and 'Animal Cell Process Engineering' covering integration of bioreaction with bioseparation coupled with on-line monitoring to improve protein production and consistency. Extensive coverage of metabolic engineering on synthesis, folding, assembly, transiting and secretion is dealt with in the session on 'Recombinant Proteins: Biosynthesis and Bioprocessing'. Two traditional but expanding areas of animal cell technology relevance are highlighted in the broad sessions of 'Animal Cells as Tools for Discovery and Testing' and 'Animal Cell Vaccines: Present and Future'. Two sessions finally cover the more recent domains of animal cell technology work - 'Tissue Engineering and Biomedical Devices' and 'Cells and Vectors for Genetic Medicine' - where one can foresee a very bright future.*

**Stem Cells**

**Ultrasound: Advances in Food Processing and Preservation**

**Microbial Community Structure**

**Wastewater Treatment Reactors**

**Biotechnology**

**Official Gazette of the United States Patent and Trademark Office**

**In vivo Models for Drug Discovery**

Biotechnology, Second Edition approaches modern biotechnology from a molecular basis, which has grown out of increasing biochemical understanding of genetics and physiology. Using straightforward, less-technical jargon, Clark and Pazdernik introduce each chapter with basic concepts that develop into more specific and detailed applications. This up-to-date text covers a wide realm of topics including forensics, bioethics, and nanobiotechnology using colorful illustrations and concise applications. In addition, the book integrates recent, relevant primary research articles for each chapter, which are presented on an accompanying website. The articles demonstrate key concepts or applications of the concepts presented in the chapter, which allows the reader to see how the foundational knowledge in this textbook bridges into primary research. This book helps readers understand what molecular biotechnology actually is as a scientific discipline, how research in this area is conducted, and how this technology may impact the future. Up-to-date text focuses on modern biotechnology with a molecular foundation Includes clear, color illustrations of key topics and concept Features clearly written without overly technical jargon or complicated examples Provides a comprehensive supplements package with an easy-to-use study guide, full primary research articles that demonstrate how research is conducted, and instructor-only resources

**Animal Biotechnology Models in Discovery and Translation**  
Academic Press

**Animal Models in Toxicology** is a single-source reference for the use of animal models in toxicology. Chapters cover nine species used in toxicology and experimental biology. With contributions from experts in toxicology, toxicological pathology, and species-specific metabolism, each of these chapters provides an excellent introductory "course" along with **Animal Experimentation: Working Towards a Paradigm Change** critically appraises current animal use in science and discusses ways in which we can contribute to a paradigm change towards human-biology based approaches.

**From Vaccines to Genetic Medicine**

**Scientific Frontiers in Developmental Toxicology and Risk Assessment**

**Animal Genomics**

**Molecular Biology of the Cell**

**Science-Based Concerns**

**Biology, Husbandry, Diseases, and Research Applications**

This book is a practical review which focuses on computational analysis and on in silico approaches towards the systematic discovery of various key functional gene expression elements in microalgae as a model. So far, in this regard very little information is available. Efficient stepwise procedures for analysing the matrix attachment regions (MARs) are outlined, as well as for translation initiation sites (TIS), signal peptide (SP) sequences, gene optimization and transformation systems. These outlines can be efficiently deployed as practical models for the systematic discovery of key expression elements and for the optimization of cis/transgenes in other micro/organisms. The first chapter is an introduction on the key gene expression elements analysed in this book, including scaffold/matrix attachment regions, translation initiation sites, signal peptides as well as gene optimization. Chapter 2 focuses on systematic strategies and computational approaches toward in silico analysis of each factor. The analyses outcomes is assessed individually in chapter 3 followed by developing the specific conceptual models for each element in Chapter 4. The concluding remarks are discussed in Chapter 5. This work is of interest to computational and experimental biologists interested in transcriptional regulation analysis as well as to researchers and scientists who wish to consider the use of bioinformatics and computational biology in design, analysis, or regulatory reviews of key gene expression elements for the production of recombinant proteins

experiments.

This two-volume textbook provides a comprehensive overview on the broad field of Animal Biotechnology with a special focus on livestock reproduction and breeding. The reader will be introduced to a variety of state-of-the-art technologies and emerging genetic tools and their applications in animal production. Also, ethics and legal aspects of animal biotechnology will be discussed and new trends and developments in the field will be critically assessed. The two-volume work is a must-have for graduate students, advanced undergraduates and researchers in the field of veterinary medicine, genetics and animal biotechnology. This second volume is dedicated to genetic tools in animal biotechnology such as somatic cloning, transgenic technologies and the application of stem cells in livestock breeding. Also, ethics and legal aspects are discussed.

The second edition of *Stem Cells: Scientific Facts and Fiction* provides the non-stem cell expert with an understandable review of the history, current state of affairs, and facts and fiction of the promises of stem cells. Building on success of its award-winning preceding edition, the second edition features new chapters on embryonic and iPS cells and stem cells in veterinary science and medicine. It contains major revisions on cancer stem cells to include new culture models, additional interviews with leaders in progenitor cells, engineered eye tissue, and xeno organs from stem cells, as well as new information on "organs on chips" and adult progenitor cells. In the past decades our understanding of stem cell biology has increased tremendously. Many types of stem cells have been discovered in tissues that everyone presumed were unable to regenerate in adults, the heart and the brain in particular. There is vast interest in stem cells from biologists and clinicians who see the potential for regenerative medicine and future treatments for chronic diseases like Parkinson's, diabetes, and spinal cord lesions, based on the use of stem cells; and from entrepreneurs in biotechnology who expect new commercial applications ranging from drug discovery to transplantation therapies. Explains in straightforward, non-specialist language the basic biology of stem cells and their applications in modern medicine and future therapy Includes extensive coverage of adult and embryonic stem cells both historically and in contemporary practice Richly illustrated to assist in understanding how research is done and the current hurdles to clinical practice

Animal biotechnology is an integral component of agriculture.

Supported with over 50 figures and more than 30 tables, this textbook is a must have for undergraduates and postgraduates of various agriculture and animal husbandry academia, teachers, professionals,

and researchers in basic as well as applied animal sciences including biotechnology, nutrition, physiology and reproduction. The book covers various topics, including economically important livestock breeds, paradigm shifts in livestock production, biotechnology in animal nutrition and in livestock-assisted reproduction, and genomics and genetic engineering tools in livestock production and management.

Products and Processes

Materials, Technologies, and Applications

Introduction to Bionanotechnology

Plant Biotechnology: Progress in Genomic Era

Stem Cell-Based Therapeutic Approaches in Disease

Innovative Bioceramics in Translational Medicine II

Use of Laboratory Animals in Biomedical and Behavioral Research

Ultrasound is an emerging technology that has been widely explored in food science and technology since the late 1990s. The book is divided into three main areas. Chapters 1 to 5 focus on the basic principles of ultrasound and how the technology works on microbial cells, enzymes, and the chemistry behind the process. Chapters 6 to 15 cover the application of ultrasound in specific food products and processes, discussing changes on food quality and presenting some innovations in food ingredients and enhancement of unit operations. Finally, Chapters 16 to 20 present some topics about manufacture of ultrasound equipment and simulation of the process, the use of the technology to treat food industry wastewater, and an industry perspective. The laws and regulations concerning emerging technologies, such as ultrasound, are also discussed, including the new Food Safety Modernization Act. Provides a clear and comprehensive panorama of ultrasound technology Contains updated research behind this technology

Brings the current tested product and future uses Explores potential future use within the food industry

The Zebrafish in Biomedical Research: Biology, Husbandry, Diseases, and Research Applications is a comprehensive work that fulfills a critical need for a thorough compilation of information on this species. The text provides significant updates for working vivarium professionals maintaining zebrafish colonies, veterinarians responsible for their care and well-being, zoologists and ethologists studying the species, and investigators using the species to gain critical insights into human physiology and disease. As the zebrafish has become an important model organism for the study of vertebrate development and disease, organ function, behavior, toxicology, cancer, and drug discovery, this book presents an important resource for future research. Presents a complete view of the zebrafish, covering their biology, husbandry, diseases and research applications Includes the work of world-renowned authors Provides the first authoritative and comprehensive treatment of zebrafish in biomedical research as part of the ACLAM series

This is a comprehensive overview of bionanotechnology to students in nanotechnology, biotechnology, bionanotechnology, related fields such as biology, chemistry, physics, and materials science and also everyone who is interested in this research area. It describes the definition of bionanomaterials, how they can be synthesized, characterized and applied in different fields. The current status and future of bionanotechnology, as well as its advantages and limitations, are comprehensively discussed throughout the book. This is an entry-level book which is easy for readers to understand its contents. In this book, we tried to identify the definition of bionanotechnology. Briefly, Bionanotechnology is the emerging research field that comes from the intersection of nanotechnology and biotechnology. Nanotechnology is referring to the design, development, and application of materials which at least one dimension at nanometer scale meanwhile biotechnology is developed based on knowledge about living systems and organisms to create or improve different products. The association of nanotechnology and biotechnology pave a way to develop a hybrid technology with unique features. Thus, this novel technology will be used to improve our living standard in different aspects from developing new medicine, food, and functional

cosmetics, introducing new methods to analyze and treat cancer to protect environmental problems. Animal biotechnology is a broad field including polarities of fundamental and applied research, as well as DNA science, covering key topics of DNA studies and its recent applications. In Introduction to Pharmaceutical Biotechnology, DNA isolation procedures followed by molecular markers and screening methods of the genomic library are explained in detail. Interesting areas such as isolation, sequencing and synthesis of genes, with broader coverage of the latter, are also described. The book begins with an introduction to biotechnology and its main branches, explaining both the basic science and the applications of biotechnology-derived pharmaceuticals, with special emphasis on their clinical use. It then moves on to the historical development and scope of biotechnology with an overall review of early applications that scientists employed long before the field was defined. Additionally, this book offers first-hand accounts of the use of biotechnology tools in the area of genetic engineering and provides comprehensive information related to current developments in the following parameters: plasmids, basic techniques used in gene transfer, and basic principles used in transgenesis. The text also provides the fundamental understanding of stem cell and gene therapy, and offers a short description of current information on these topics as well as their clinical associations and related therapeutic options.

Principles and Applications

The Zebrafish in Biomedical Research

Landmark Experiments in Molecular Biology

Surgical Applications

Current Threats and Management Trends

Basic Techniques and Concepts

Animal Biotechnology 2

Heavy metal and metalloid contamination of groundwater and surface water ecosystems involves important policy-related and ethical issues besides its more well-known scientific aspects. Heavy Metal and Metalloid Contamination of Surface and Underground Water: Environmental, Policy, and Ethical Issues has brought these three dimensions under a single volume. The book presents an updated status of the nature and extent of heavy metal and metalloid contamination of water and discuss its future implications. In Section I, the book provides a state-of-the-art review of research findings on entry, storage, and release, human health risks, and the uptake and accumulation by freshwater biota and the toxic effects experienced by them. The book also provides information on the bioremediation of heavy metals and metalloids, and the possible effects of climate change on their distribution and toxicity. Section II of the book throws light on the policies and legislations adopted in several countries to deal with the vexed issue of metal contamination of waters in both historical and current perspectives. Special emphasis has been given to the contamination of drinking water and its attendant implications for human health. The book also treats the relevance and applications of Integrated Water Resources Management (IWRM), which forms the backbone of the water policies of several countries. In Section III, discussions focus on ethical issues rising out of heavy metal and metalloid contamination of water, and on the different ethical approaches and principles in both indigenous and other societies. Features: A systematic overview of the major facets of heavy metal and metalloid contamination of water Compilation and analysis of the latest research in the subject area Ample case studies in all chapters that highlight specific problems

Review of policy and legislation for the control of heavy metal pollution of water  
Water ethics in indigenous societies This book will be a vital resource for students and research scholars in the field of environmental science, ecotoxicology, and pollution studies.

Landmark Experiments in Molecular Biology critically considers breakthrough experiments that have constituted major turning points in the birth and evolution of molecular biology. These experiments laid the foundations to molecular biology by uncovering the major players in the machinery of inheritance and biological information handling such as DNA, RNA, ribosomes, and proteins. Landmark Experiments in Molecular Biology combines an historical survey of the development of ideas, theories, and profiles of leading scientists with detailed scientific and technical analysis. Includes detailed analysis of classically designed and executed experiments Incorporates technical and scientific analysis along with historical background for a robust understanding of molecular biology discoveries Provides critical analysis of the history of molecular biology to inform the future of scientific discovery Examines the machinery of inheritance and biological information handling

This publication provides an update on the current status of gene maps in different livestock and pet/companion animal species. The findings summarized in species specific commentaries and original articles testify the rapid advances made in the field of animal genomics. Of significant interest is the fact that current investigations are providing headways for two important and exciting research fronts: targeted high-resolution mapping leading to the application of genomic information in addressing questions of economic and biological significance in animals, and the initiation of whole genome sequencing projects for some of the animal species. Like in humans and mice, this will set the stage for a new level of research and real time complex analysis of the genomes of these species.

Animal Genomics signifies the beginning of a new era in this field and celebrates the achievements of the past 20 years of genomics research. It will be of special interest to researchers involved in genome analysis - both gross chromosomal as well as molecular - in various animal species, and to comparative and evolutionary geneticists.

This one-stop reference is the first to present the complete picture -- covering all relevant organisms, from single cells to mammals, as well as all major disease areas, including neurological disorders, cancer and infectious diseases.

Addressing the needs of the pharmaceutical industry, this unique handbook adopts a broad perspective on the use of animals in the early part of the drug development process, including regulatory rules and limitations, as well as numerous examples from real-life drug development projects. After a general introduction to the topic, the expert contributors from research-driven pharmaceutical companies discuss the basic considerations of using animal models, including ethical issues. The main part of the book systematically surveys the most important disease areas for current drug development, from

cardiovascular to endocrine disorders, and from infectious to neurological diseases. For each area, the availability of animal models for target validation, hit finding and lead profiling is reviewed, backed by numerous examples of both successes and failures among the use of animal models. The whole is rounded off with a discussion of perspectives and challenges. Key knowledge for drug researchers in industry as well as academia.

Working Towards a Paradigm Change

Animal Biotechnology 1

Experimental Animal Models of Human Diseases

Introduction to Pharmaceutical Biotechnology, Volume 1

Plant Diseases

This two-volume textbook provides a comprehensive overview on the broad field of Animal Biotechnology with a special focus on livestock reproduction and breeding. The reader will be introduced to a variety of state-of-the-art technologies and emerging genetic tools and their applications in animal production. Also, ethics and legal aspects of animal biotechnology will be discussed and new trends and developments in the field will be critically assessed. The two-volume work is a must-have for graduate students, advanced undergraduates and researchers in the field of veterinary medicine, genetics and animal biotechnology. This first volume mainly focuses on artificial insemination, embryo transfer technologies in diverse animal species and cryopreservation of oocytes and embryos.