tolerance and quality traits have been isolated and re-introduced into otherwise sensitive or susceptible species by a number of methods, including anther/microspore culture, somaclonal variation, embryo culture and somatic embryogenesis. For instance, anther/microspore culture, somaclonal variation, embryo culture and somatic embryogenesis can be used to create new cultivars that are more resistant to environmental stress. In addition, genes that confer insect- and disease-resistance, abiotic stress tolerance, herbicide tolerance, and other useful traits can be introduced into plants using genetic modification techniques. 

Fundamentals of Biochemistry

L-lysine and other essential amino acids that regulate the cell function. Many of the essential activities of the cell are dependent on lysosomes. Dysfunction is linked to multiple diseases, including storage disorders, neurodegeneration, immunological diseases, and cancer. This book discusses concepts and methods used to study lysosome function and small molecule transport. The contents will not only attract accomplished investigators in need of a broad review and synthesis of this important subject but will also appeal to young investigators and trainees acquiring knowledge in this area of biochemical and cellular biology.

Advancement in Crop Improvement Techniques

This book offers a comprehensive review of recent advances in crop improvement techniques. It includes discussions on the use of genetic engineering, biotechnology, and other modern approaches to improve crop yields. The book covers the latest developments in research and technology, providing a valuable resource for researchers, educators, and practitioners in the field of agricultural science.

Computational Bioinformatics

Rice Chemistry and Technology, Fourth Edition, is a new, fully revised update on the very popular previous edition published by AACC International Press. The book covers rice growth, development, breeding, grain structure, phylogenetics, rice starch, proteins and lipids. A detailed section covers rice as a food product, health aspects, and quality analysis from a cooking and sensory science perspective. Final chapters address advances in the technology of rice, with extensive coverage of post harvest technology, biotechnology, and genomics applications for rice grain quality. With its new, internationally recognized editor, this new edition will be of interest to all rice scientists and technologists, providing a comprehensive overview of the latest developments in rice research and technology.

Rice

Advances in Plant Breeding Strategies: Vegetable Crops

Bioinformatics in Agriculture: Next Generation Sequencing Era is a comprehensive volume presenting an integrated research and development approach to the practical application of genomics to improve agricultural crops. Exploring both the theoretical and applied aspects of computational biology, and focusing on rice as example plant, this book highlights the increased productivity of a translational approach. Presented in four sections addressing insights from experts from around the world, this book includes: Section I: Bioinformatics and Next Generation Sequencing Technologies; Section II: Omics Application; Section III: Data mining and Markers Discovery; and Section IV: Artificial Intelligence and Agribots.

Practical Approaches to Biological Inorganic Chemistry

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Lysosomes are key subcellular organelles that regulate the cell function. Many of the essential activities of the cell are dependent on lysosomes. Dysfunction is linked to multiple diseases, including storage disorders, neurodegeneration, immunological diseases, and cancer. This book discusses concepts and methods used to study lysosome function and small molecule transport. The contents will not only attract accomplished investigators in need of a broad review and synthesis of this important subject but will also appeal to young investigators and trainees acquiring knowledge in this area of biochemical and cellular biology.

Genome Engineering via CRISPR-Cas9 System

Siddhartha Mukherjee underlying concern that the field of genomics is too complex and not accessible enough to the general public. The book is written in a way that makes it accessible to a broad audience, while also providing a comprehensive overview of the latest developments in this field.

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improving nutritional quality, enabling crops to be raised under adverse conditions and developing resistance to pests and diseases for sustaining global food and nutritional security. The overarching purpose of this volume work is to summarize the history of crop improvement from a technological perspective but to do so with a forward outlook on further advancement and adaptability to a changing world. Our carefully chosen “case studies of important plant crops” intend to serve a diverse spectrum of readers looking for the right tools to tackle complicated local and global issues.

**The CRISPR/Cas Tool Kit for Genome Editing**

**Biotechnologies of Crop Improvement, Volume 3**

Written in easy to follow language, the book presents cutting-edge agriculturally relevant plant biotechnologies and applications in a manner that is accessible to all. This book updates and introduces the scope and method of plant biotechnologies and molecular breeding within the context of environmental analysis and assessment, a diminishing supply of productive arable land, scarce water resources and climate change. New plant breeding techniques including CRISPR-Cas system are now tools to meet these challenges both in developed countries and in developing countries. Ethical issues, intellectual property rights, regulation policies in various countries related to agricultural biotechnology are examined. The rapid developments in plant biotechnology are explained to a large audience with relevant examples. New varieties of crops can be adapted to new climatic conditions in order to reduce pest associated issues and the adverse abiotic effects.

**Curriculum Applications In Microbiology: Bioinformatics In The Classroom**

High throughput screening remains a key part of early-stage drug and tool candidate discovery, and methods and technologies have seen many fundamental improvements and innovations over the past 20 years. This comprehensive book provides a historical survey of the field up to the current state-of-the-art. In addition to the specific methods, this book also considers cultural and organizational questions that represent opportunities for future success. Through this thought-provoking forward and introduction from Professor Stuart Schreiber and the editors, chapters from leading experts across academia and industry cover initial considerations for screening, methods appropriate for different goals in small molecule discovery, newer technologies that provide alternative approaches to traditional miniaturization procedures, and practical aspects such as cost and resourcing. While the context of their historical development, authors explain common pitfalls and their solutions. This book will serve as both a practical reference and a thoughtful guide to the philosophy underlying technological change in such a fast-moving area for postgraduates and researchers in academia and industry, particularly in the areas of chemical biology, pharmacology, structural biology and assay development.

**Natural Products from Actinomycetes**

Early anthropological evidence for plant use as medicine is 60,000 years old as reported from the Neanderthal grave in Iraq. The importance of plants as medicine is further supported by archaeological evidence from Asia and the Middle East. Today, around 1.4 billion people in South Asia alone have no access to modern health care, and rely instead on traditional medicine to alleviate various symptoms. On a global basis, 20% to 30% of pharmaceuticals are used either natively or as pharmaceutical derivatives for life-threatening conditions that include diabetes, hypertension and cancers. As the demand for plant-based medicine rises, there is an unmet need to investigate the quality, safety and efficacy of these herbal by the “scientific” methods. Current research on drug discovery from medicinal plants involves a multifaceted approach combining botanical, phytochemical, analytical, and molecular techniques. For instance, there is no question that holistic science was developed by industry. It is now possible to carry out deep probe physical and chemical properties in thousands of compounds which are then screened for key enzymes or a subset of receptors. This and other technologies thus offer hope here may eventually identify compounds for treating a variety of diseases or conditions. However, drug development from natural products is not without its problems. Frequent challenges encountered include the procurement of appropriate raw materials, the selection and implementation of appropriate high-throughput technologies, and the scaling-up of preparatory procedures. Research scientists should therefore arm themselves with the right tools and knowledge in order to harness the vast potential of plant biological resources. The main objective of Plant and Human Health is to serve as a comprehensive guide for this endeavor. Volume 1 highlights how humans from specific areas or cultures use medicinal plants. Despite technological developments, herbal drugs still occupy a preferential place in the majority of the population in the third world and have slowly taken root in alternative medicine in the west. The integration of modern science with traditional uses of herbal drugs is important for our understanding of this ethnomedical relationship. Volume 2 deals with the phytochemical and molecular characterization of herbal medicine. Specifically, it will focus on the secondary metabolite compounds which afford protection against diseases. Finally, Volume 3 focuses on the physiological mechanisms by which the active ingredients of medicinal plants serve to improve human health. Together these three-volume collection intends to bridge the gap for herbalists, traditional and modern medical practitioners, and students and researchers in botany and horticulture.

**Het gen**

The advanced AI techniques are essential for resolving various problematic aspects emerging in the field of bioinformatics. This book covers the recent approaches in artificial intelligence and machine learning methods and their applications in Genomics and Gene editing, cancer drug discovery classification, and the protein folding algorithms among others. Deep learning, which is widely used in image processing, is also applicable in bioinformatics as one of the most popular artificial intelligence approaches. The wide range of applications discussed in this book are an indispensable resource for computer scientists, engineers, biologists, mathematicians, physicists, and medical informatics. Features: Focuses on the cross-disciplinary relation between computer science and biology and the role of machine learning methods in resolving complex problems in bioinformatics Provides a comprehensive and balanced blend of topics that covers large body of knowledge in the field of various advanced algorithms Presenting cutting-edge research methodologies in the area of AI methods when applied to bioinformatics and innovative solutions Discusses AI and its techniques, their use, and their potential for use in common and future bioinformatics applications Includes recent achievements in AI and bioinformatics contributed by a global team of researchers.

**Genome Editing**

Health Informatics: Practical Guide focuses on the application of information technology in healthcare to improve individual and population health, education and research. The goal of the seventh edition is to stimulate and educate healthcare and IT professionals and students about the key topics in this rapidly changing field. Dr. William Morris and from Oregon Health & Science University is the co-editor and author of multiple chapters. Topics include Health Informatics (HI) overview, electronic health records, healthcare data analytics, health information exchange, architecture of information systems, evidence-based medicine, consumer health informatics, HI ethics, quality improvement strategies and more. The 32 chapter feature overview of the information systems chapter, reviewing each of the chapters in this new edition and is a comprehensive guide for oncologists, embryologists, researchers and advanced students.

**Introduction to Bioinformatics with R**

This thoroughly revised second edition is an up-to-date overview of the current knowledge of the ‘niches’ and the field of bioinformatics in the genomics domain. This book discusses the field of bioinformatics and its role in the development of the field to the current state-of-the-art. It will also focus on the role of bioinformatics in the role in the development of the field to many others. This book describes the history of bioinformatics from a technological perspective. The purpose of this book is to provide readers with the tools needed to discover new potential applications of bioinformatics and to develop tools for their own research.

**The Model Legume M edicago truncatula, A 2 Volume Set**

Plants are vulnerable to pathogens including fungi, bacteria, and viruses, which cause critical problems and deficits. Crop protection by plant breeding delivers a promising solution with no obvious effect on human health or the local ecosystem. Crop improvement has been the most powerful approach for producing unique crop cultivars since domestication occurred, making possible the main innovations in feeding the globe and community development. Genome editing is one of the genetic devices that can be implemented, and disease resistance is currently cited as the most encouraging application of CRISPR/Cas technology in agriculture. Nanotechnology has harnessed the power of genome editing to develop agricultural crops. Nanotechnology approaches could contribute to raising the ability and performance of CRISPR genome editing technology. This book brings together the latest research in these areas. CRISPR and R-NAs Systems: Nanobiotechnology Approaches to Plant Breeding and Protection presents a complete understanding of the R-NAs and CRISPR/Cas technology for controlling mycotoxins, fighting plant nematodes, and detecting plant pathogens. CRISPR/Cas genome editing enables efficient targeted modification in most crops, thus providing a new tool for management of plant pathogens, and plant viruses. This book is an important reference source for both plant scientists and environmental scientists who want to understand how molecular biotechnology can be used to provide more efficient plant breeding and plant protection. Outlines the major techniques and applications of both CRISPR and RNAi technologies. Assesses the major challenges of escalating these technologies on a mass scale.

**Future Foods**

Genome Engineering via CRISPR-Cas9 Systems presents a compilation of chapters from eminent scientists from across the globe who have established expertise in working with CRISPR-Cas9 systems. Currently, targeted genome engineering is a key technology for basic science, biomedical and industrial
applications due to the relative simplicity to which they can be designed, used, and applied. However, it is not easy to find relevant information gathered in a single source. The book contains a wide range of applications of CRISPR in research of bacteria, virus, algae, plant and mammalian and also discusses the modeling of droplets, ethylene and proteases, among others. Other topics covered include diagnosis, sensor, and therapeutic applications, as well as ethical and regulatory issues. This book is a valuable source not only for beginners in genome engineering, but also researchers, clinicians, stakeholders, policy makers, and practitioners interested in the potential of CRISPR-Cas9 in several fields. Provides basic understanding and a clear picture on how to design, use and implement the CRISPR-Cas9 system in different organisms. Explains how to create an animal model for disease research and screening purposes using CRISPR. Discusses the application of CRISPR-Cas9 systems in basic sciences, biomedicine, virology, bacteriology, molecular biology, neurology, cancer, industry, and many more.

Recent Trends and Techniques in Plant Metabolic Engineering

In this Special Issue, we have several papers related to fuel cell-based cogeneration systems, the management and control of fuel cell systems, the analysis, simulation, and operation of different types of fuel cells, modeling and online-experimental validation, and the environment assessment of cathode materials in lithium-ion battery energy generation systems. A paper which gives a comprehensive review with technical guidelines for the design and operation of fuel cells, especially in a cogeneration system setup, which can be an important source of references for the optimal design and operation of various types of fuel cells in cogeneration systems, can also be found in this Special Issue.

Computer Vision and Internet of Things

Recent developments in biotechnologies relevant to the characterization, sustainable use and conservation of genetic resources for food and agriculture

Moleculaire biologietechnieken II

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