The Role Of Biotechnology In Countering Btw Agents 1st Edition

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.

As the oldest and largest human intervention in nature, the science of agriculture is one of the most intensely studied practices. From manipulation of plant gene structure to the use of plants for bioenergy, biotechnology interventions in plant and agricultural science have been rapidly developing over the past ten years with immense forward leaps on an annual basis. This book begins by laying the foundations for plant biotechnology by outlining the biological aspects including gene structure and expression, and the basic procedures in plant biotechnology of genomics, metabolomics, transcriptomics and proteomics. It then focuses on a discussion of the impacts of biotechnology on plant breeding technologies and germplasm sustainability. The role of biotechnology in the improvement of agricultural traits, production of industrial products and pharmaceuticals as well as biomaterials and biomass provide a historical perspective and a look to the future. Sections addressing intellectual property rights and sociological and food safety issues round out the holistic discussion of this important topic. Includes specific emphasis on the inter-relationships between basic plant biotechnologies and applied agricultural applications, and the way they contribute to each other Provides an updated review of the major plant biotechnology procedures and techniques, their impact on novel agricultural development and crop plant improvement Takes a broad view of the topic with discussions of practices in many countries

The principal message of this book is that thermodynamics and statistical mechanics will benefit from replacing the unfortunate, misleading and mysterious term "entropy" with a more familiar, meaningful and appropriate term such as information, missing information or uncertainty. This replacement would facilitate the interpretation of the "driving force" of many processes in terms of informational changes and dispel the mystery that has always enshrouded entropy. It has been 140 years since Clausius coined the term "entropy"; almost 50 years since Shannon developed the mathematical theory of "information"--Subsequently renamed "entropy." In this book, the author advocates replacing "entropy" by "information," a term that has become widely used in many branches of science. The author also takes a new and bold approach to thermodynamics and statistical mechanics. Information is used not only as a tool for predicting distributions but as the fundamental cornerstone concept of thermodynamics, held until now by the term "entropy." The topics covered include the fundamentals of probability and information theory; the general concept of information as well as the particular concept of information as applied in thermodynamics; the re-derivation of the Sackur-Tetrode equation for the entropy of an ideal gas from purely informational arguments; the fundamental formalism of statistical mechanics; and many examples of simple processes the "driving force" for which is analyzed in terms of information.

. . . recommended to anyone interested in the thrilling subject of the relationship of IPRs and innovation. Ralf Uhrich, Journal of Intellectual Property This is an outstanding piece of scholarship. It will serve as a powerful stimulant for new research in the field and as a reliable guide for practitioners. Calestous Juma, Harvard University, US Intellectual property rights (IPRs), particularly patents, occupy a prominent position in innovation systems, but to what extent they support or hinder innovation is widely disputed. Through the lens of biotechnology, this book delves deeply into the main issues at the crossroads of innovation and IPRs to evaluate claims of the positive and negative impacts of IPRs on innovation. An international group of scholars from a range of disciplines economic geography, health law, business, philosophy, history, public health, management examine how IPRs actually operate in innovation systems, not just from the perspective of theory but grounded in their global, regional, national, current and historical contexts. In so doing, the contributors seek to uncover and move beyond deeply held assumptions about the role of IPRs in innovation systems. Scholars and students interested in innovation, science and technology policy, intellectual property rights and technology transfer will find this volume of great interest. The findings will also be of value to decision makers in science and technology policy and managers of intellectual property in biotechnology and venture capital firms.

Biotechnology and Innovation Systems

Plant Biotechnology and Agriculture

The Role of Biotechnology in Training and Education for Food-based Industries in Asean Countries

Introduction to Pharmaceutical Biotechnology, Volume 1

Prospects for the 21st Century

Theory and Application

The field of biotechnology has revolutionized the concepts in agriculture, food, industrial feed stocks and health care in the past three decades. It has furnished new tools and techniques to enhance the agricultural productivity, raise value-added products and health care systems and has ensured better environments. Over the years it has exploited biological systems at all levels of complexity or organisations for improving the life of common man. Scientific breakthroughs in gene expression, protein engineering, and drug designing, animal health care, industrial chemistry, preservation of biodiversity and cell fusion are being increasingly translated into new products and services. Rapid advances in different areas of biotechnology have ushered tremendous changes in agriculture, medicine and cell biology. The present book Current Topics in Biotechnology incorporates reviews articles on varied aspects of biotechnology. The volume contains 10chapters written by experts in the disciplines, Dr. Edison T Liu, Executive Director of the Genome Institute of Singapour has briefly discussed "What is next in biotechnology?" Dr Weichang Yu and Dr James A.Birchler have reviewed "Minichromosomes: The next generation technology for plant genetic engineering". Dr V S Hanur, Indian Institute of Horticultural Research, Hesaraghatta, Bangalore has reviewed the pertinent information on Plant stem cells: Molecular biology and Biotechnology. Sonali Chadha discusses Cloning Vectors: the vehicles of genetic engineering. Dr Dapinder Bakshi and J K Arora(Add Director, Biotechnology, PSCST, Chandigarh) have made excellent attempt to present a succinct review on GENETICALLY MODIFIED CROPS IN INDIAN PERSPECTIVE. Considering that cotton fiber biology is important for describing, defining and refining fundamental questions in the fields of cell and developmental biology, Prof. C P Malik, Dr Bhavneet Kaur, Chitra Wadhwani and Aman Verma have discussed the Mechanism of cotton fiber development. Prof. C P Malik, Aman Verma, Chitra Wadhwani and Bhavneet Kaur(Dr) have made indepth survey and reviewed the pertinent literature on bt cotton and its coomerical use. Prof C P Malik and his colleagues have compiled recent literature on the technique especially molecular biology of fruit ripening. The chapter on prions; THE LETHAL PROTEINS by Chitra Wadhwani and C P Malik is aimed at looking at the prion diseases from a molecular point of view.taking into account the genetic as well as the transmissible and spordic aspect of the disease.THE ROLE OF BIOTECHNOLOGY IN PROLONGING THE SHELF LIFE OF FRUITS. dRS. S P Vyas and Amit K Goyal have done extremely fascinathing job to review the available literature on PLANT DERIVED EDIBLEVACCINES. The present volume is a must for all science libraries catering to the needs of postgraduate students and doctoral scholars:to the teachers and students engaged in teaching and research in biotechnology, Physiology and plant sciences, Agriculture, plant breeding, Animal breeding. The book will serve as an excellent reference source for advanced topics in Biotechnology.

Between 1973 and 2016, the ways to manipulate DNA to endow new characteristics in an organism (that is, biotechnology) have advanced, enabling the development of products that were not previously possible. What will the likely future products of biotechnology be over the next 5â€"10 years? What scientific capabilities, tools, and/or expertise may be needed by the regulatory agencies to ensure they make efficient and sound evaluations of the likely future products of biotechnology? Preparing for Future Products of Biotechnology analyzes the future landscape of biotechnology products and seeks to inform forthcoming policy making. This report identifies potential new risks and frameworks for risk assessment and areas in which the risks or lack of risks relating to the products of biotechnology are well understood.

Based on the first scientific conference convened at the Library of Alexandria, 'Biotechnology and Sustainable Development: Voices of the South and North', which was held in Alexandria, Egypt, in March 2002, this book contains overviews of agriculture, health, ethics and the environment. It discusses how dramatic improvements in food security, health, and lifestyle could accrue to the poor people of developing countries through the applications of new technologies.

Biotechnology is vital to counter biological and toxin weapons. Without biotechnology, the detection, identification and diagnoses of, and medical countermeasures to such weapons would be virtually impossible. As biological and toxin agents occur in natural outbreaks of disease or intoxications, there are both civil and military benefit to be had from the use of biotechnology in providing effective countermeasures to such agents. The role of biotechnology in countering biological and toxin weapons is here addressed under seven major headings: The wider political and economic contexts; Enabling technologies for BTW agent detection; The applicability of biotechnological methods for BTW agent detection on the battlefield, in a terrorist incident, and in an inspection environment; Pre-exposure medical countermeasures; Diagnosis and identification; Post-exposure treatment and decontamination; Contribution of biotechnology to strengthening international conventions against BTW agents.

Volume 2: Perspective for Value-Added Products and Environments

Animal Health and Biotechnology

Current Developments in Biotechnology and Bioengineering

The Role of Biotechnology in Improvement of Livestock

Biotechnology and Sustainable Development

Technical Symposium on Earth Systems Engineering

Dealing with the challenges presented by climate change or rapid urban development require cooperation and expertise from engineering, social and natural sciences. Earth systems engineering is an emerging area of multidisclinary study that takes a holistic view of natural and human system interactions to better understand complex systems. It seeks to develop methods and tools that enable technically sound and ethically wise decisions. Engineering and Environmental Challenges presents the proceedings of a National Academy of Engineering public symposium on Earth systems engineering.

This book explores how policies targeting public research institutions, such as universities, contribute to the appropriation of biotechnology through national innovation systems. Around the world, biotechnology has become a driving force for dramatic change in systems and policies intended to spur innovation. The leading contributors expertly construct a detailed picture of policy approaches that support biotechnology and how such approaches work under different economic and social conditions. They also provide an insight into the role of universities in this process. Researchers, academics, students, policy advisors, decision-makers and other professionals involved, and working in, the fields of biotechnology, innovation systems, higher education and development will find this book an invaluable resource.

Current Developments in Biotechnology and Bioengineering: Crop Modification, Nutrition, and Food Production provides extensive coverage of new developments, state-of-the-art technologies, and potential future trends, presenting data-based scientific knowledge on agribiotechnology and describing world agriculture and the role biotechnology can play in ensuring food security over the next fifty years. The book discusses the effects of climate change in agriculture and the resultant emergence of new crops, including drought tolerant and more nutritious plants. In addition, the book discusses insect and virus resistance in plants and outlines plant metabolic engineering for agriculture, genetically engineered plants, and microbial diseases. Highlights recent developments in agriculture due to biotechnology Relates the effect of climate change in agriculture to the development of new crops Describes the application of metabolic engineering in the development of new genetically modified plants

Scientific advances over the past several decades have accelerated the ability to engineer existing organisms and to potentially create novel ones not found in nature. Synthetic biology, which collectively refers to concepts, approaches, and tools that enable the modification or creation of biological organisms, is being pursued overwhelmingly for beneficial purposes ranging from reducing the burden of disease to improving agricultural yields to remediating pollution. Although the contributions synthetic biology can make in these and other areas hold great promise, it is also possible to imagine malicious uses that could threaten U.S. citizens and military personnel. Making informed decisions about how to address such concerns requires a realistic assessment of the capabilities that could be misused. Biodefense in the Age of Synthetic Biology explores and envisions potential misuses of synthetic biology. This report develops a framework to guide an assessment of the security concerns related to advances in synthetic biology, assesses the levels of concern warranted for such advances, and identifies options that could help mitigate those concerns.

The Role of Biotechnology in a Sustainable Food Supply

Emerging Consequences of Biotechnology

Biotechnology: Prospects and Applications

Engineering and Environmental Challenges

Biodiversity Loss and IPR Issues

Recent Advancement in White Biotechnology Through Fungi

The Role of Biotechnology in Countering BTW AgentsSpringer Science & Business Media

The use of fossil fuels results in rising CO2 and other greenhouse gas (GHG) emissions, causing global temperature rise and climate change that will negatively impact human health, the food supply, and eventually worsen hunger and misery. Presently, fossil fuels meet 88% of the energy demand, resulting in rising CO2/GHG emissions at alarming rates. The increased use of biofuels would help to mitigate climate change. Efficiently designing methods for the production of biofuels and plant-derived high-value products requires a deeper understanding of photosynthetic processes as a prerequisite for applying novel biotechnologies. Accordingly, this book provides ample information and a wealth of illustrative examples. The book's eighteen richly illustrated chapters are divided into three thematic parts. I: Photosynthesis and Biomass Production under Changing Conditions, II: Microalgae and Engineered Crops for Production of Biofuels and High-value Products, and III: Genetic Resources and Engineering Methods to Improve Crop Plants. Readers will find the latest information on the molecular basis of photosynthetic processes in plants (including the regulatory principles that allow plants to maintain homeostasis under changing conditions), stress resistance and synthetic pathways. In addition, the basic principles of important biotechnologies, as well as examples of specially designed crops capable of growing under stress conditions with improved productivity, are presented. The book sets the course for future research in the field of biofuel development and production and provides both general and specific information for students, teachers, academic researchers, industrial teams, and general readers who are interested in new developments concerning the production of biofuels with value-added properties.

An instructive and comprehensive overview of the use of biotechnology in agriculture and food production, Biotechnology in Agriculture and Food Processing: Opportunities and Challenges discusses how biotechnology can improve the quality and productivity of agriculture and food products. It includes current topics such as GM foods, enzymes, and prod

Biotechnology in the food processing sector targets the selection and improvement of microorganisms with the objectives of improving process control, yields and efficiency as well as the quality, safety and consistency of bioprocessed products. Biotechnology is a broad term associated with many complex processes involving organisms and technology. They are basically related to food and agriculture. Biotechnology finds use in improvement of nutrition value of various kinds of foods to enhance the quality of human life. The application of recombinant DNA techniques to biological organisms, systems, and processes constitutes an exciting new biology that is being used to increase agricultural productivity and to improve the health of humans and animals. These advances coupled with those resulting from more traditional genetic and chemical approaches are having and will continue to have an enormous impact on the production of food throughout the world. Biotechnology is the use of livelihood systems and organisms to expand or make useful products, or any technical applications that uses organic systems, living organisms or derivatives thereof, to make or transform products or processes for specific use. Depending on the tools and applications, it often overlaps with the fields of bioengineering and biomedical engineering. A number of the applications were identified in this paper to include biotechnology in food fermentation to enhance properties such as the taste, aroma, shelf-life, texture and nutritional worth of food. Biotechnology in the production of enzymes to bring regarding desirable changes in food, biotechnology in the production of food ingredients; flavours, fragrances, food additives and a range of other towering valued-added products, genetically modified starter cultures, genetically modified foods, the use of all these modern technologies in diagnostics for food testing, the role of biotechnology in food production by increasing food production, improved harvesting, storage and nutritional value, better raw materials, better flavour and the production of food containing vaccines, the safety of food produced with biotechnology as well as the risks and benefits of biotechnology in food production. This book focuses on the application of biotechnology to the processing of food. It discusses biotechnological tools and options that are applicable to the study and improvement of the quality, safety and consistency of foods. The contents of the book will be immensely helpful to students and researchers of biotechnology and food science.

Crop Modification, Nutrition, and Food Production

Between Commerce and Civil Society

Biotechnology in Agriculture and Food Processing

Pharmaceutical Biotechnology

Hearing Before the Subcommittee on International Economic Policy, Export and Trade Promotion of the Committee on Foreign Relations, United States Senate, One Hundred Sixth Congress, Second Session, July 12, 2000

The Role of Biotechnology in Exploring and Protecting Agricultural Genetic Resources

Pharmaceutical Biotechnology offers students taking Pharmacy and related Medical and Pharmaceutical courses a comprehensive introduction to the fast-moving area of biopharmaceuticals. With a particular focus on the subject taken from a pharmaceutical perspective, initial chapters offer a broad introduction to protein science and recombinant DNA technology- key areas that underpin the whole subject. Subsequent chapters focus upon the development, production and analysis of these substances. Finally the book moves on to explore the science, biotechnology and medical applications of specific biotech products categories. These include not only protein-based substances but also nucleic acid and cell-based products. introduces essential principles underlining modern biotechnology- recombinant DNA technology and protein science an invaluable introduction to this fast-moving subject aimed specifically at pharmacy and medical students includes specific 'product category chapters' focusing on the pharmaceutical, medical and therapeutic properties of numerous biopharmaceutical products. entire chapter devoted to the principles of genetic engineering and how these drugs are developed. includes numerous relevant case studies to enhance student understanding no prior knowledge of protein structure is assumed

This report surveys opportunities for future Army applications in biotechnology, including sensors, electronics and computers, materials, logistics, and medical therapeutics, by matching commercial trends and developments with enduring Army requirements. Several biotechnology areas are identified as important for the Army to exploit, either by direct funding of research or by indirect influence of commercial sources, to achieve significant gains in combat effectiveness before 2025.

Major and exciting changes have taken place recently in various aspects of bio technology and its applications to forestry. Even more exciting is the prospect of major innovations that the entire field of biotechnology holds for plant growth in general. The importance of these developments for the forestry sector is considerable, particu larly since forestry science has not received the kinds of technical and R&D inputs that, say, agriculture has received in the past few decades. Y ct the problems of defor estation as well as stagnation in yields and productivity of existing forests throughout the world are becoming increasingly apparent, with consequences and ecological ef fects that cause growing worldwide concern. Policies for application of existing knowl edge in biotechnology to the field of forestry and priorities for future research and development are, therefore, of considerable value, because it is only through the adop tion of the right priorities and enlightened policies that scientific developments will move along the right direction, leading to improvements in forestry practices through out the world. It was against this backdrop that the Tata Energy Research Institute (TERI) or ganised a major international workshop on the "Applications of Biotechnology in For estry and Horticulture" at New Delhi in January 1988. The present volume covers the proceedings of this international workshop.

Executive summary and recommendations. Scientific aspects. Funding and institutions. Training. Technology transfer.

Preparing for Future Products of Biotechnology

Environmental Biotechnology

Biotechnology and Food Production

Opportunities in Biotechnology for Future Army Applications

Modern Applications of Plant Biotechnology in Pharmaceutical Sciences

Applications of Biotechnology in Neurology

White biotechnology is industrial biotechnology dealing with various biotech products through applications of microbes. The main application of white biotechnology is commercial production of various useful organic substances, such as acetic acid, citric acid, acetone, glycerine, etc., and antibiotics like penicillin, streptomycin, mitomycin, etc., and value added product through the use of microorganisms especially fungi and bacteria. The value-added products included bioactive compounds, secondary metabolites, pigments and industrially important enzymes for potential applications in agriculture, pharmaceuticals, medicine and allied sectors for human welfare. In the 21st century, techniques were developed to harness fungi to protect human health (through antibiotics, antimicrobial, immunosuppressive agents, value-added products etc.), which led to industrial scale production of enzymes, alkaloids, detergents, acids, biosurfactants. The first large-scale industrial applications of modern biotechnology have been made in the areas of food and animal feed production (agricultural/green biotechnology) and pharmaceuticals (medical/red biotechnology). In contrast, the production of bio-active compounds through fermentation or enzymatic conversion is known industrial or white biotechnology. The beneficial fungal strains may play important role in agriculture, industry and the medical sectors. The beneficial fungi play a significance role in plant growth promotion, and soil fertility using both, direct (solubilization of phosphorus, potassium and zinc; production of indole acetic acid, gibberellic acid, cytokinin and siderophores) and indirect (production of hydrolytic enzymes, siderophores, ammonia, hydrogen cyanides and antibiotics) mechanisms of plant growth promotion for sustainable agriculture. The fungal strains and their products (enzymes, bio-active compounds and secondary metabolites) are very useful for industry. The discovery of antibiotics is a milestone in the development of white biotechnology. Since then, white biotechnology has steadily developed and now plays a key role in several industrial sectors, providing both high valued nutraceuticals and pharmaceutical products. The fungal strains and bio-active compounds also play important role in the environmental cleaning. This volume covers the latest research developments related to value-added products in white biotechnology through fungi.

This book examines how biotechnology can improve livestock breeding and farming, and thereby also animal products. In the first chapters the reader will discover which techniques and approaches are currently used to improve animal breeding, animal health and the value of animal products. Particular attention is given to reproduction techniques, animal nutrition and livestock vaccines that not only enhance animal health but also have a significant effect on human health by ensuring safe food procurement and preventing zoonotic diseases. In addition, modern biotechnology can increase not only productivity but also the consistency and quality of animal food, fiber and medical products. In the second part of the book, issues such as how animal biotechnology could affect the environment and the important topic of animal waste management are explored. In the concluding chapter, the authors discuss future challenges related to animal biotechnology. This work will appeal to a wide readership, from scientists and professionals working in animal production, to those in farm animal management and veterinary science.

This book covers a range of important topics in biotechnology policy, advocacy and education, bioethics, biosafety regulations for genetically modified organisms and gene-edited products and biotechnology manpower development. Throughout the book, the contributors review biosafety and bioethical guidelines that could enhance adoption of biotechnology in alignment with national priorities and research agendas. They also discuss the importance of current biotechnology policy advocacy, enlightenment and public engagement with stakeholders and policy makers. The book will be useful reference material for scientists and researchers working in the fields of food and agricultural biotechnology, biopharmaceuticals and medical biotechnology, environmental biotechnology, biotechnology policy and advocacy, biotechnology communication and manpower development, biosafety and bioethics, etc. Emphasizes recent advances in biotechnology that could ameliorate the high-level global food insecurity through the deployment of the technology in Nigeria Provides detailed information on how to domesticate biotechnology and boost training of the biotechnology workforce in the universities and research institutes Introduces new frontiers in the area of organizing informal biotechnology capacity building courses and professional certification Reviews biosafety and bioethical guidelines that could enhance adoption of biotechnology in alignment with national priorities and research agendas Discusses current biotechnology policy advocacy, enlightenment and public engagement with stakeholders and policy makers Sylvia Uzochukwu, Ph.D., is a Professor of Food Science and Biotechnology, and Director, Biotechnology Centre, Federal University, Oye-Ekiti, Nigeria. Arinze Stanley Okoli, Ph.D., is an Associate Professor at Genoek – Centre for Biosafety, Universitetet II, Breivika, Tromsoe, Norway. Nwadiuto (Diuoto) Esiobu, Ph.D., is a Professor of Microbiology and Biotechnology at Florida Atlantic University, Boca Raton, FL, USA, and the President and Founder of Applied Biotech, Inc. and ABINL. Emeka Godfrey Nwoba, Ph.D., is currently at the Algae Research & Development Centre, Murdoch University, Western Australia. Christpeace Nwagbo Ezebuiro, Ph.D., is a Project Manager, Renewable Energy Expert and Head of Clean Technology Division at the National Biotechnology Development Agency, Abuja, Nigeria. Charles Oluwaseun Adetunji, Ph.D., is an Associate Professor of Microbiology and Biotechnology and the Director of Intellectual Property and Technology Transfer, Edo State University Uzairue, Nigeria. Abdulrazak B. Ibrahim, Ph.D., is a Capacity Development Expert at the Forum for Agricultural Research in Africa (FARA) and Associate Professor of Biochemistry, Ahmadu Bello University, Zaria, Nigeria. Benjamin Ewa Ubi, Ph.D., is a Professor of Plant Breeding and Biotechnology and Director, Biotechnology Research and Development Centre, Ebonyi State University Abakaliki, Nigeria.

Modern Applications of Plant Biotechnology in Pharmaceutical Sciences explores advanced techniques in plant biotechnology, their applications to pharmaceutical sciences, and how these methods can lead to more effective, safe, and affordable drugs. The book covers modern approaches in a practical, step-by-step manner, and includes illustrations, examples, and case studies to enhance understanding. Key topics include plant-made pharmaceuticals, classical and non-classical techniques for secondary metabolite production in plant cell culture and their relevance to pharmaceutical science, edible vaccines, novel delivery systems for plant-based products, international industry regulatory guidelines, and more. Readers will find the book to be a comprehensive and valuable resource for the study of modern plant biotechnology approaches and their pharmaceutical applications. Builds upon the basic concepts of cell and plant tissue culture and recombinant DNA technology to better illustrate the modern and potential applications of plant biotechnology to the pharmaceutical sciences Provides detailed yet practical coverage of complex techniques, such as micropropogation, gene transfer, and biosynthesis Examines critical issues of international importance and offers real-life examples and potential solutions

Policy, Advocacy, and Capacity Building

Role of Biotechnology in Agriculture

Applications of Biotechnology in Oncology

The Role of Biotechnology in Assessing Future Land Use Within Western Europe

Basic Techniques and Concepts

Biosafety and Bioethics in Biotechnology

Environmental change is affecting the world's agricultural productivity. This is coupled with an increase in population: according to the United Nations Department for Economic and Social Affairs, the global population is estimated to reach 9.7 billion by 2050. Therefore, the current situation requires that we develop climate-smart technologies to improve crop productivity to sustain the ever-rising global population. Current-day farmers are introducing a considerable amount of agrochemicals to enhance crop productivity. Indiscriminate agrochemical application has altered not only the soil's physic-chemical and biological properties but also affected human health through food chain contamination. Cyanobacteria, under these changing environmental conditions, may help to resolve the problem significantly without changing the natural soil properties. In spite of their well-known stress tolerance potential, most of the cyanobacterial stress management and signaling pathways are yet to be fully characterized. Therefore, there is an urgent need to explore cyanobacterial metabolism under stress as well as their regulatory pathways to exploit them for sustainable agriculture. In recent decades, the application of cyanobacteria has attracted scientists because of uniqueness, better adaptability, and synthetic products. Diverse cyanobacterial communities with the ability to fix atmospheric nitrogen, together with their photosynthetic properties, have demonstrated their application under field conditions. Several cyanobacterial species have thus been exploited to enhance soil fertility, mitigate biotic and abiotic stress, and contamination management. Cyanobacterial Lifestyle and its Applications in Biotechnology has been designed to discuss different aspects of cyanobacterial physiology with the aim of helping to provide a better understanding of advanced cyanobacterial molecular biology and their metabolism to uncover the potential of cyanobacteria in the tailoring of stress smart crops for sustainable agriculture. Chapters include valuable information about the role of cyanobacteria in the evolution of life, cyanobacterial photosynthesis, stress-tolerant cyanobacterium, biological nitrogen fixation, circadian rhythms, genetics and molecular biology of abiotic stress responses. Summarizes various aspects of cyanobacterial research. Includes comprehensive coverage of molecular approaches for the identification of cyanobacteria and their evolution. Identifies an expanding horizon of cyanobacterial lifestyle: stress management in cyanobacteria. Examines cyanobacteria synthetic biology, genetic engineering, photosynthesis and metabolic engineering.

This contributed volume compiles the latest improvements in the field of biotechnology. It focuses on topics that comprises industrial, environment, agricultural and medical related issues to technology and biological studies and exhibits the correlation between the biological world and the dependence of humans on it. The book is organized into five parts covering the role of biotechnology in industrial products, environmental remediation, agriculture and pharmacological agents. Ranging from micro-scale studies to macro, it covers a huge domain of agricultural biotechnology and focuses on important commercial crops (e.g. cacao and coffee), arbuscular mycorrhizal fungi, flow and distribution of phosphorus in agricultural soils in the Latin American region. Overall, the book portrays the importance of modern biotechnology and its role in solving the problems in modern day life. The book is a ready reference for practicing students, researchers of environmental engineering, chemical engineering, agricultural engineering, and other allied fields likewise.

"While other books have addressed isolated aspects of recent developments in the biomedical sciences, Biotechnology: Between Commerce and Civil Society is the first book tgo engage with the full range of biotechnology's implications for social science and for society at large." -Professor Volker Meja New scientific knowledge is no longer merely the key to unlocking the secrets of nature and society. It now represents the "becoming" of a new world. Scientific developments affect the ways in which we conduct our affairs, as well as how we comprehend the changes underway as the result of novel technical artefacts and scientific knowledge. The practical fruits of biotechnology are a case in point; they have grasped our imaginations, and generated worldwide debate and concern. Debates on biotechnology shift between images of utopia and dystopia. The social sciences deserve a voice in the debate, and can do so through sober examination of the economic, social, and cultural implications of biotechnology. Some economists even predict that the importance of biotechnology as the technology of the future will far exceed that of the information technologies, in particular the Internet. The contributors to this volume are drawn from a broad spectrum of the social sciences, and include Nico Stehr, Gene Rosa, Steve Fuller, Steve Best and Douglas Kellner, Nikolas Rose, Fred Buttel, Javier Lezaun, Anne Kerr, Susanna Hornig Priest and Toby Ten Eyck, Martin Schulte, Alexander Somek, Steven P. Vallas, Daniel Lee Kleinman, Abby Kinchy and Raul Necochea, Herbert Gottweis, J. Rogers Hollingsworth, Gysli Pblsson, Elizabeth Ettore, Richard Hindmarch and Reiner Grundmann. The impact of science on society is destined to be a fundamental concern in the new century. This volume illustrates the contributions anthropology, law, political science, and sociology can make to the ongoing discussions about the role of biotechnology in modern societies. Nico Stehr is senior research associate, Institut for Technikfolgenabschotzung, Forschungszentrum Karlsruhe and Institut for Kostenforschung, GKSS, Germany. He also is a fellow in the Center for Advanced Cultural Studies in Essen, Germany, editor of the Canadian Journal of Sociology, and a fellow of the Royal Society of Canada. Among his recent books are Werner Sombart: Economic Life in the Modern Age (with Reiner Grundmann, published by Transaction); The Fragility of Modern Societies: Knowledge and Risk in the Information Age; Knowledge and Economic Conduct: The Social Foundations of the Modern Economy; and Wissenspolitik: Die ?berwachung des Wissens.

Biotechnology: Prospects and Applications covers the review of recent developments in biotechnology and international authorship presents global issues that help in our understanding of the role of biotechnology in solving important scientific and societal problems for the benefit of mankind and environment. A balanced coverage of basic molecular biology and practical applications, relevant examples, colored illustrations, and contemporary applications of biotechnology provide students and researchers with the tools and basic knowledge of biotechnology. In our effort to introduce students and researchers to cutting edge techniques and applications of biotechnology, we dedicated specific chapters to such emerging areas of biotechnology as Emerging Dynamics of Brassinosteroids Research, Third generation green energy, Bioremediation, Metal Organic Frameworks: New smart materials for biological application, Bioherbicides, Biosensors, Fetal Mesenchymal Stem Cells and Animal forensics. Biotechnology: Prospects and Applications will be highly useful for students, teachers and researchers in all disciplines of life sciences, agricultural sciences, medicine, and biotechnology in universities, research stations and biotechnology companies. The book features broader aspects of the role of biotechnology in human endeavor. It also presents an overview of prospects and applications while emphasizing modern, cutting-edge, and emerging areas of biotechnology. Further, it provides the readers with a comprehensive knowledge of topics in food and agricultural biotechnology, microbial biotechnology, environmental biotechnology and animal biotechnology. The chapters have been written with special reference to the latest developments in above broader areas of biotechnology that impact the biotechnology industry. A list of references at the end of each chapter is provided for the readers to learn more about a particular topic. Typically, these references include basic research, research papers, review articles and articles from the popular literature.

Agricultural Biotechnology

The Role of Biotechnology in Countering BTW Agents

Voices of the South and North

Biodefense in the Age of Synthetic Biology

The Role of Biotechnology in Combating Poverty and Hunger in Developing Countries

Concepts and Applications

"This publication addresses the role of biotechnology in a sustainable food supply in the 21st century. What sets this book apart is the thread that connects the broad subject matters and diverse author group. The chapters focus on the challenges, opportunities, success stories, barriers and risks associated with biotechnology. Authors are experts from around the world with bro and points of view. They include experts in the international aid and development, leaders in the developments and use of biotechnology in food applications, experts in food safety and risk associated with the use of biotechnology, and leaders in cosidering social, political and ethical issues surrounding the use of technology. The greatest strength of this book is the experitise a by our authors and their diversity"--

Culling together excerpts from a wide range of writings by Dr. Kewal K. Jain on biotechnology topics as they relate to disorders of the nervous system, Applications of Biotechnology in Neurology covers a variety of applications for those working in life sciences and the pharmaceutical sciences, particularly those developing diagnostics and therapeutics for the nervous system. T into areas such as neurobiotechnology, like neurogenomics and neuroproteomics, molecular diagnostics, various methods of improving systemic administration of drugs for targeted delivery to the nervous system, including the use of nanobiotechnology, biotechnology-based strategies and products for neuroprotection, as well as chapters on neurosurgery and personalized neu edge, and thoughtfully organized, Applications of Biotechnology in Neurology serves as an ideal guide, supplemented by 75 tables and 16 figures as well as numerous references from recent literature on this topic, which are appended to each chapter.

The application of biologically-engineered solutions to environmental problems has become far more readily acceptable and widely understood. However there remains some uncertainty amongst practitioners regarding how and where the microscopic, functional level fits into the macroscopic, practical applications. It is precisely this gap which the book sets out to fill. Dividing the strands covering pollution, waste and manufacturing, the book examines the potential for biotechnological interventions and current industrial practice, with the underpinning microbial techniques and methods described, in context, against this background. Each chapter is supported by located case studies from a range of industries and countries to provide readers with an overv applications for biotechnology. Essential reading for undergraduates and Masters students taking modules in Biotechnology or Pollution Control as part of Environmental Science, Environmental Management or Environmental Biology programmes. It is also suitable for professionals involved with water, waste management and pollution control.

"Chapters 1 to 14 of in this book are based on papers presented at Sessions I, II and IV of an international workshop held from 5 to 7 March 2005 entitled, The Role of Biotechnology for the Characterisation and Conservation of Crop, Forestry, Animal and Fishery Genetic Resources, organized by the FAO Working Group on Biotechnology (FAO-WGB), the Fondazione per le Bi Society of Agriculture Genetics (SIGA). The workshop took place at the Villa Gualino Congress Center in Turin, Italy ...The remaining two chapters, 15 and 16, are from the e-mail conference organized by the FAO-WGB roughly three months after the Turin workshop."--P. xi.

Current Topics in Biotechnology

The Role of Public Policy

The Role of Biotechnology in Agriculture

Innovations in Biotechnology for a Sustainable Future

Climate Change, Photosynthesis and Advanced Biofuels

In the context of South Asian Association for Regional Cooperation countries.

Applications of Biotechnology in Oncology collects key writings by Kewal K. Jain on the most important contributions of biotechnology to cancer research, particularly to the molecular diagnosis of cancer and drug delivery in cancer for personalized management of patients. Basics of various " omics " technologies and their application in oncology are described as oncogenomics and oncoproteomics. This detailed volume also explores molecular diagnostics, nanobiotechnology, cell and gene therapies, as well as personalized oncology. With approximately one thousand selected references from recent literature on this topic and numerous tables and figures, Applications of Biotechnology in Oncology serves as an ideal reference for oncologists, scientists involved in research on cancer biology, and physicians in various specialties who deal with cancer.

Applications of Biotechnology in Forestry and Horticulture

Biotechnology

The Role of Biotechnology in the Production of Value-added Plant Bio-products

The Role of Intellectual Property Rights in Biotechnology Innovation

Strategies for National Competitiveness

Opportunities and Challenges