Nanotechnology In Tamil


Fungi Bio-prospects in Sustainable Agriculture, Environment and Nano-technology-Vijay Kumar Sharma 2020-10-09 Fungi bio-prospects in sustainable agriculture, environment and nanotechnology is a three-volume series that has been designed to explore the huge potential of the many diverse applications of fungi to human life. The series unveils the latest developments and scientific advances in the study of the biodiversity of fungi, extremophilic fungi, and fungal secondary metabolites and enzymes, while also presenting cutting-edge molecular tools used to study fungi. Readers will learn all about the recent
progress and future potential applications of fungi in agriculture, environmental remediation, industry, food safety, medicine, and nanotechnology. Volume 1 will cover the biodiversity of fungi and the associated biopotential applications. This volume offers insights into both basic and advanced biotechnological applications in human welfare and sustainable agriculture. The chapters shed light on the different roles of fungi as a bio-fertilizer, a bio-control agent, and a component of microbial inoculants. They also focus on the various applications of fungi in bio-fuel production, nano-technology, and in the management of abiotic stresses such as drought, salinity, and metal toxicity. Provides a deep understanding of fungi and summarizes fungi’s various applications in the fields of microbiology and sustainable agriculture. Describes the role of fungal inoculants as biocontrol agents, and in improved stress tolerance and growth of plants.

Nanobiomaterials in Antimicrobial Therapy-Alexandru Grumezescu 2016-03-08
Nanobiomaterials in Antimicrobial Therapy presents novel antimicrobial approaches that enable nanotechnology to be used effectively in the treatment of infections. This field has gained a large amount of interest over the last decade, in response to the high resistance of pathogens to antibiotics. Leading researchers from around the world discuss the synthesis routes of nanobiomaterials, characterization, and their applications as antimicrobial agents. The books covers various aspects: mechanisms of toxicity for inorganic nanoparticles.
against bacteria; the development of excellent carriers for the transport of a high variety of antimicrobials; the use of nanomaterials to facilitate both diagnosis and therapeutic approaches against infectious agents; strategies to control biofilms based on enzymes, biosurfactants, or magnetotactic bacteria; bacterial adhesion onto polymeric surfaces and novel materials; and antimicrobial photodynamic inactivation. This book will be of interest to postdoctoral researchers, professors and students engaged in the fields of materials science, biotechnology and applied chemistry. It will also be highly valuable to those working in industry, including pharmaceutics and biotechnology companies, medical researchers, biomedical engineers and advanced clinicians. A methodical approach to this highly relevant subject for researchers, practitioners and students working in biomedical, biotechnological and engineering fields A valuable guide to recent scientific progress and the latest application methods Proposes novel opportunities and ideas for developing or improving technologies in nanomedicine and nanobiology

Nanobiomaterials in Drug Delivery-Alexandru Mihai Grumezescu 2016-04-26
Nanobiomaterials in Drug Delivery: Applications of Nanobiomaterials presents novel approaches regarding nanostructured drug delivery systems, revealing the most investigated materials for the development of particular nanobioshuttles. This book brings the results of current research to reach those who wish to use this knowledge in an applied
setting, providing one coherent text, with focused chapters and easily accessible information. At its core, it is a collection of titles, bringing together many of the novel applications these materials have in biology, also discussing the advantages and disadvantages of each application and the perspectives of the technologies based on these findings. At the moment, there is no other comparable book series covering all the subjects approached in this set of titles. Provides up-to-date and well-structured reference material for students, researchers, and practitioners working in the biomedical, biotechnological, and engineering fields. Presents a valuable guide to recent scientific progress, along with most known applications of nanomaterials in the biomedical area. Proposes novel opportunities and ideas for developing or improving technologies in nanomedicine/nanobiology.

**Nanostructured Materials for Environmental Applications** - Subramanian Balakumar

2021 This book discusses how nanostructured materials play a key role in helping address environmental challenges. Employing nanostructured materials in catalysis can increase the efficient decomposition of toxic pollutants in air, water, and soil. This multidisciplinary book discusses the most promising nanostructured materials made-up of metals, metal oxides, metal chalcogenides, multi-metal oxides, carbon nanostructures, and hybrid materials that can address environmental remediation. It provides a well-referenced introduction to newcomers from allied disciplines and will be valuable to researchers in academia, industry,
and government working on solutions to environmental problems. Provides a state-of-the-art review of key concepts of nanostructured materials in environmental science. Discusses the most promising nanostructured materials that can assist with environmental remediation. Illustrates challenges and opportunities for development, experimental design, methodology, and interpretation of results.

**Nanobiotechnology in Agriculture** - Khalid Rehman Hakeem 2020-04-17

Agriculture is considered as a backbone of developing nations as it caters the needs of the people, directly or indirectly. The global agriculture currently faces enormous challenges like land degradation and reduced soil fertility, shrinking of land, low production yield, water accessibility and a dearth of labor due to evacuation of individuals from farming. Besides, the global population increases at an exponential rate and it is predicted that the global population will be 9 billion by 2050 that in turn leads to food crisis in near future. Although, green revolution revolutionizes the agriculture sector by enhancing the yield but it was not considered as a sustainable approach. Exorbitant use of chemical fertilizers and pesticides to boost the crop yield is definitely not a convenient approach for agriculture sustainability in the light of the fact that these chemical fertilizers are considered as double-edged sword, which on one hand enhance the crop yield but at the same time possess deleterious effect on the soil microflora and thus declines its fertility. Besides, it cause irreversible damage to
the soil texture and disrupts the equilibrium in the food chain across ecosystem, which might in turn lead to genetic mutations in future generations of consumers. Thus, the increased dependence on fabricated agricultural additives during and post green revolution has generated serious issues pertaining to sustainability, environmental impact and health hazards. Therefore, nano-biotechnology has emerged as a promising tool to tackle the above problems especially in the agriculture sector. Nano-agribusiness is an emerged field to enhance crop yield, rejuvenate soil health, provide precision farming and stimulate plant growth. Nano-biotechnology is an essential tool in modern agriculture and is considered as a primary economic driver in near future. It is evaluated that joining of cutting edge nanotechnology in agribusiness would push the worldwide monetary development to approximately US$ 3.4 trillion by 2020 which clearly indicates that how agri-nanobiotechnology plays a pivotal role in the agricultural sector, without any negative impact on the environment and other regulatory issues of biosafety. Agri-nanobiotechnology is an innovative green technology, which provides the solution to global food security, sustainability and climate change. The current book is presenting the role of nano-biotechnology in modern agriculture and how it plays a pivotal role to boost the agri-business.

Nanoparticles in the Fight Against Parasites-Heinz Mehlhorn 2016-01-14 This book
sheds new light on the use of nanoparticles in the fields of parasitology and public and animal health. Nanotechnology has been used in many fields of research and in practical applications. A special subgroup is represented by the so-called nanobiotechnology, which is a multidisciplinary integration of biotechnology, nanotechnology, chemical processing, material science and engineering. In the fields of parasitology and public and animal health this technology has been used to develop systems, wherein acaricides and insecticides are included. This technique avoids direct contact of the hosts of parasites (animals, humans) with the insecticides/acaricides and thus minimizes effects on their health and also the development of resistances of the vectors (ticks, mosquitoes, flies etc.). Since actually many original articles on the use of nanoparticles bearing arthropodocides appear in different journals – as well as in Parasitology Research of Springer - it seems reasonable to check the status quo and to elucidate possible chances of progress. This book will appeal to a wide readership, from researchers through veterinarians to professionals working in the conservation, public health, or sustainable agriculture area.

**An Introduction to Nanoscience and Nanotechnology**-Alain Nouailhat 2010-01-05 This book recalls the basics required for an understanding of the nanoworld (quantum physics, molecular biology, micro and nanoelectronics) and gives examples of applications in various fields: materials, energy, devices, data management and life sciences. It is clearly shown
how the nanoworld is at the crossing point of knowledge and innovation. Written by an expert who spent a large part of his professional life in the field, the title also gives a general insight into the evolution of nanosciences and nanotechnologies. The reader is thus provided with an introduction to this complex area with different "tracks" for further personal comprehension and reflection. This guided and illustrated tour also reveals the importance of the nanoworld in everyday life.

**Hybrid Nanocomposites** - Kaushik Pal 2019-03-11 Understanding surfaces and interfaces is a key challenge for those working on hybrid nanomaterials and where new imaging and analysis spectroscopy/electron microscopy responses are vital. The variability and site recognition of biopolymers, such as DNA molecules, offer a wide range of opportunities for the self-organization of wire nanostructures into much more complex patterns, while the combination of 1D nanostructures consisting of biopolymers and inorganic compounds opens up a number of scientific and technological opportunities. This book discusses the novel synthesis of nanomaterials and their hybrid composites; nanobiocomposites; transition metal oxide nanocomposites; spectroscopic and electron microscopic studies; social, ethical, and regulatory implications of various aspects of nanotechnology; and significant foreseeable applications of some key hybrid nanomaterials. The book also looks at how technology might be used in the future, estimating, where possible, the likely timescales in
which the most far-reaching applications of technology might become a reality. Current research trends and potential future advances, such as nanomaterials, nanometrology, electronics, optoelectronics, and nanobiotechnology, are discussed, in addition to the benefits they are currently providing in the short, medium, and long terms. Furthermore, the book explains the current and possible future industrial applications of nanotechnology, examines some of the barriers to its adoption by industry, and identifies what environmental, health and safety, ethical, or societal implications or uncertainties may arise from the use of the technology, both current and future.

**Biomaterials and Nanotechnology for Tissue Engineering**-Swaminathan Sethuraman 2016-10-26 Nanotechnology and high-end characterization techniques have highlighted the importance of the material choice for the success of tissue engineering. A paradigm shift has been seen from conventional passive materials as scaffolds to smart multi-functional materials that can mimic the complex intracellular milieu more effectively. This book presents a detailed overview of the rationale involved in the choice of materials for regeneration of different tissues and the future directions in this fascinating area of materials science with specific chapters on regulatory challenges & ethics; tissue engineered medical products.
**Corrosion Protection at the Nanoscale**-Susai Rajendran 2020-03-10

Corrosion Protection at the Nanoscale explores fundamental concepts on how metals can be protected at the nanoscale by using both nanomaterials-based solutions, including nanoalloys, noninhibitors and nanocoatings. It is an important reference resource for both materials scientists and engineers wanting to find ways to create an efficient corrosion prevention strategy.

Nanostructure materials have been widely used in many products, such as print electronics, contact, interconnection, implant, nanosensors and display units to lessen the impact of corrosion. Traditional methods for protection of metals include various techniques, such as coatings, inhibitors, electrochemical methods (anodic and cathodic protections), metallurgical design are covered in this book. Nanomaterials-based protective methods can offer many advantages over their traditional counterparts, such as protection for early-stage, higher corrosion resistance, better corrosion control. This book also outlines these advantages and discusses the challenges of implementing nanomaterials as corrosion protection agents on a wide scale. Explains the main methods of detection, monitoring, testing, measurement and simulation of corrosion at the nanoscale. Explores how metals can be protected at the nanoscale using nanotechnology and nanomaterials. Discusses the major challenges of detecting and preventing corrosion at the nanoscale.

**Biogenic Nano-Particles and their Use in Agro-ecosystems**-Mansour Ghorbanpour
Several nano-scale devices have emerged that are capable of analysing plant diseases, nutrient deficiencies and any other ailments that may affect food security in agro-ecosystems. It has been envisioned that smart delivery systems can be developed and utilised for better management of agricultural ecosystems. These systems could exhibit beneficial, multi-functional characteristics, which could be used to assess and also control habitat-imposed stresses to crops. Nanoparticle-mediated smart delivery systems can control the delivery of nutrients or bioactive and/or pesticide molecules in plants. It has been suggested that nano-particles in plants might help determine their nutrient status and could also be used as cures in agro-ecosystems. Further, to enhance soil and crop productivity, nanotechnology has been used to create and deliver nano fertilizers, which can be defined as nano-particles that directly help supply nutrients for plant growth and soil productivity. Nano-particles can be absorbed onto clay networks, leading to improved soil health and more efficient nutrient use by crops. Additionally, fertilizer particles can be coated with nano-particles that facilitate slow and steady release of nutrients, reducing loss of nutrients and enhancing their efficiency in agri-crops. Although the use of nanotechnology in agro-ecosystems is still in its early stages and needs to be developed further, nano-particle-mediated delivery systems are promising solutions for the successful management of agri-ecosystems. In this context, the book offers insights into nanotechnology in agro-ecosystems with reference to biogenic nanoparticles. It highlights the: • occurrence and diversity of Biogenic Nanoparticles • mechanistic approach involved
in the synthesis of biogenic nanoparticles • synthesis of nanoparticles using photo-
activation, and their fate in the soil ecosystem • potential applications of nanoparticles in
agricultural systems • application and biogenic synthesis of gold nanoparticles and their
characterization • impact of biogenic nanoparticles on biotic stress to plants • mechanistic
approaches involved in the antimicrobial effects and cytotoxicity of biogenic nanoparticles •
role of biogenic nanoparticles in plant diseases management • relevance of biological
synthesized nanoparticles in the longevity of agricultural crops • design and synthesis of
nano-biosensors for monitoring pollutants in water, soil and plant systems • applications of
nanotechnology in agriculture with special refer to soil, water and plant sciences A useful
resource for postgraduate and research students in the field of plant and agricultural
sciences, it is also of interest to researchers working in nano and biotechnology.

Nanoscale Engineering in Agricultural Management-Ramesh Raliya 2019-04-30
Agriculture plays a vital role in our lives, providing food and economic benefits. Today, it
faces severe challenges, due to decreasing arable land, depleting natural resources,
changing climate pattern, and yet increasing demand for food. The recent introduction of
nanotechnology in agriculture offers sustainable and precise solutions for developing smart
agriculture practices and addressing the challenges faced by the ag-sector. Therefore, it is
essential to understand this new science from a multidimensional perspective. Experts in
the field have contributed in putting together this volume, covering topics like plant growth, protection and management using engineering nanoscale materials. The chapters in the book have been peer-reviewed and selected for publication based on independent reviewers’ reports. The book covers very specific, in-depth, and fundamental and applied aspects of the latest ag-nanotechnology research. It is hoped that each chapter of the book will be very useful for researchers, policy makers, and other audiences from interdisciplinary scientific subjects.

**The Moringa Genome** - N. Manikanda Boopathi

**NANOTECHNOLOGY VOL.2** - WM Breck 2018-01-01 The book is a complete treatise on nanotechnology, which encompasses how we harness our knowledge of nano science to create materials, machines and devices that will fundamentally change the way we live and work. The entire text of this second volume is divided into eleven sections. The chapters have been written in a simple and easy to follow language. This is an ideal textbook for undergraduate and postgraduate students of various Indian universities pursuing different courses in engineering. It will also be a valuable source of information for professionals, researchers and industrialists associated with materials science, etc.
Nanoscience in Food and Agriculture 5-Shivendu Ranjan 2017-07-12 This book presents comprehensive reviews on the principles, design and applications of nanomaterials in the food and agriculture sectors. This book is the fifth of several volumes on Nanoscience in Food and Agriculture, published in the series Sustainable Agriculture Reviews.

Encyclopedia of Nanoscience and Society-David H. Guston 2010-07-14 Labeled either as the "next industrial revolution" or as just "hype," nanoscience and nanotechnologies are controversial, touted by some as the likely engines of spectacular transformation of human societies and even human bodies, and by others as conceptually flawed. These challenges make an encyclopedia of nanoscience and society an absolute necessity. Providing a guide to what these understandings and challenges are about, the Encyclopedia of Nanoscience and Society offers accessible descriptions of some of the key technical achievements of nanoscience along with its history and prospects. Rather than a technical primer, this encyclopedia instead focuses on the efforts of governments around the world to fund nanoscience research and to tap its potential for economic development as well as to assess how best to regulate a new technology for the environmental, occupational, and consumer health and safety issues related to the field. Contributions examine and analyze the cultural significance of nanoscience and nanotechnologies and describe some of the organizations, and their products, that promise to make nanotechnologies a critical part of the global
economy. Written by noted scholars and practitioners from around the globe, these two volumes offer nearly 500 entries describing the societal aspects of nanoscience and nanotechnology. Key Themes - Art, Design, and Materials - Bionanotechnology Centers - Context - Economics and Business - Engagement and the Public - Environment and Risk - Ethics and Values - Geographies and Distribution - History and Philosophy - Integration and Interdisciplinarity - Nanotechnology Companies - Nanotechnology Organizations

**Nanotechnology and Development**-Shyama V. Ramani 2014-04-28 Nanotechnology is a generic platform with potential applications in many sectors. It promises to be a motor of economic growth with inclusive development through innovation related to materials, foods, medicines, and so on. This book identifies the nature and magnitude of the nanotechnology divide between high-income countries and the rest of the world. It also studies the determinants of the evolution and functioning of state policy and technology clusters in developed regions like the USA and the EU in order to identify the strategies that can or cannot be replicated elsewhere. Tracing the trajectories in nanotechnology being carved out by four emerging countries: China, India, Brazil and Mexico, it identifies common as well as country-specific factors that influence the rates of return to public and private investment related to nanotechnology in emerging countries. The book also makes policy recommendations to bridge the nanotechnology divide while promoting economic growth
and inclusive development.

**Postharvest Biology and Nanotechnology**-Gopinadhan Paliyath 2019-01-30 A comprehensive introduction to the physiology, biochemistry, and molecular biology of produce growth, paired with cutting-edge technological advances in produce preservation. Revised and updated, the second edition of Postharvest Biology and Nanotechnology explores the most recent developments in postharvest biology and nanotechnology. Since the publication of the first edition, there has been an increased understanding of the developmental physiology, biochemistry, and molecular biology during early growth, maturation, ripening, and postharvest conditions. The contributors—noted experts in the field—review the improved technologies that maintain the shelf life and quality of fruits, vegetables, and flowers. This second edition contains new strategies that can be implemented to remedy food security issues, including but not limited to phospholipase D inhibition technology and ethylene inhibition via 1-MCP technology. The text offers an introduction to technologies used in production practices and distribution of produce around the world, as well as the process of senescence on a molecular and biochemical level. The book also explores the postharvest value chain for various produce, quality evaluation techniques, and the most current nanotechnology applications. This important resource: • Expands on the first edition to explore in-depth postharvest biology with
emphasis on developments in nanotechnology • Contains contributions from leaders in the field • Includes the most recent advances in postharvest biology and technology, including but not limited to phospholipase D and 1-MCP technology • Puts the focus on basic science as well as technology and practical applications • Applies a physiology, biochemistry, and biotechnology approach to the subject Written for crop science researchers and professionals, horticultural researchers, agricultural engineers, food scientists working with fruits and vegetables, Postharvest Biology and Nanotechnology, Second Edition provides a comprehensive introduction to this subject, with a grounding in the basic science with the technology and practical applications.

Characterization and Biology of Nanomaterials for Drug Delivery - Shyam Mohapatra
2018-10-05 Characterization and Biology of Nanomaterials for Drug Delivery: Nanoscience and Nanotechnology in Drug Delivery describes the techniques successfully employed for the application of nanocarriers loaded with the antioxidant enzyme, catalase, and thus targeted to endothelial cells. Methods of nanocarrier synthesis, loading within various systems, and the characterization of nanocarriers for targeting activities are covered, as are their advantages, disadvantages and applications. Reflecting the interdisciplinary nature of the subject matter, this book includes contributions by experts from different fields, all with various backgrounds and expertise. It will appeal to researchers and students from different
disciplines, such as materials science, technology and various biomedical fields. Enables readers from different fields to access recent research and protocols across traditional boundaries. Focuses on protocols and techniques, as well as the knowledge base of the field, thus enabling those in R&D to learn about, and successfully deploy, cutting-edge techniques. Explores both current and emerging classes of nanomaterials, along with their fundamentals and applications.

**Aquananotechnology** - Kamel A. Abd-Elsalam 2020-12-01
Aquananotechnology: Applications of Nanomaterials for Water Purification focuses on the impacts of, and opportunities for, the application of nanotechnology to enhance water quality and the societal concerns surrounding the widespread use of nanotechnology in the water arena. Sections cover the use of nano-sensors for the detection of water pollutants, the control of waterborne pathogens, and the use of nano-biochar coal fly composites for phytoremediations wastewater pollutants. In addition, the book explores the uses of nano-adsorbents for heavy metals, dyes, Arsenic, pesticides, and water/wastewater remediation and decontamination of water from xenobiotics, bionanocomposites, metal oxides, silver, zinc nanoparticles, and carbon-based nanomaterials for wastewater treatment. In addition, the book covers the use of zerovalent iron nanomaterials and nanostructured mesoporous silica for water purification, along with nano-hydrogels to increase water efficiency and conservation.
Finally, the socioeconomic impacts and risks of aquananotechnology in ecosystems are discussed. This book provides a detailed description of the ecological applications of nanomaterials in aquatic environments, offering a cogent analysis of both major applications and challenges. Shows how a range of nanomaterial types are being used for ecological applications in aquatic environments. Explores the effects different types of nanomaterials have on a variety of ecosystems. Assesses the major challenges of using nanotechnology to improve water quality on a mass scale.

**Phytonanotechnology**-N. Thajuddin 2020-05-31 Phytonanotechnology: Challenges and Prospects consolidates information on the use of phytonanoparticles for biomedical, environmental, and agricultural applications, covering recent advances in experimental and theoretical studies on various properties of nanoparticles derived from plant sources. The book deals with various attributes of phytonanoparticles, discussing their current and potential applications. In addition, it explores the development of phytonanoparticles, synthesis techniques, characterization techniques, environmental remediation applications, anti-microbial properties, miscellaneous applications, and multi-functional applications. Risks associated with nanoparticles are also discussed. This book is an important reference for materials scientists, engineers, environmental scientists, food scientists, and biomedical scientists who want to learn more about the applications of nanoparticles derived from plant sources.
sources. Explores synthesis methods of phytonanoparticles from a variety of plant groups
Discusses the major biological reactions of phytonanoparticles Outlines the major
opportunities and challenges of using phytonanoparticles in biomedical, environmental and
agricultural applications

Sustainable Nanoscale Engineering-Gyorgy Szekely 2019-09-18 Sustainable Nanoscale Engineering: From Materials Design to Chemical Processing presents the latest on the design of nanoscale materials and their applications in sustainable chemical production processes. The newest achievements of materials science, in particular nanomaterials, opened new opportunities for chemical engineers to design more efficient, safe, compact and environmentally benign processes. These materials include metal-organic frameworks, graphene, membranes, imprinted polymers, polymers of intrinsic microporosity, nanoparticles, and nanofilms, to name a few. Topics discussed include gas separation, CO2 sequestration, continuous processes, waste valorization, catalytic processes, bioengineering, pharmaceutical manufacturing, supercritical CO2 technology, sustainable energy, molecular imprinting, graphene, nature inspired chemical engineering, desalination, and more. Describes new, efficient and environmentally accepted processes for nanomaterials design Includes a large array of materials, such as metal-organic frameworks, graphene, imprinted polymers, and more Explores the contribution of these materials in the development of
sustainable chemical processes

Nanotechnology-Based Sustainable Alternatives for the Management of Plant Diseases—Giorgio Mariano Balestra 2021-10-23 Nanotechnology-based Sustainable Alternatives for the Management of Plant Diseases addresses the power of sustainable nanomaterials for plant and food protection. The book highlights dangers arising from bacteria, fungi, viruses, insects, seeds, plants, fruits and food production and summarizes new and sustainable strategies. It places a particular focus on plant pathogen control, and in the food packaging sector in agri-food applications. The control of plant pathogens in plants and in food has been conventionally made by adding chemical preservatives and by using thermal processing, but sustainable nanotechnology can be a power tool to aid in this complex set of challenges. Advances in materials science have led to the rapid development of nanotechnology that has great potential for improving food safety as a powerful tool for the delivery and controlled release of natural antimicrobials. Analyzes and lays out information related to sustainable strategies, taking a nano-based approach to the management of plant diseases and biotic damage on fresh food Presents the latest discoveries and practical applications of nanotechnology based, sustainable plant protection strategies to combat dangerous microorganisms and improve the shelf-life of food Assesses the major challenges of manufacturing nanotechnology-based pesticides on a mass scale
Nanotechnology Characterization Tools for Tissue Engineering and Medical Therapy-Challa S.S.R. Kumar 2019-11-22 Ninth volume of a 40 volume series on nanoscience and nanotechnology, edited by the renowned scientist Challa S.S.R. Kumar. This handbook gives a comprehensive overview about Nanotechnology Characterization Tools for Tissue Engineering and Medical Therapy. Modern applications and state-of-the-art techniques are covered and make this volume an essential reading for research scientists in academia and industry.

Advances in Plant Physiology (Vol.15)-A. Hemantaranjan 2014-12-01 In view of changes in the global environment, it is important to determine and developing technologies to ameliorate metabolic limitations by biological processes most sensitive to abiotic stress factors warning crop productivity. It is reaffirmed that publishing the important Treatise Series has been undertaken with a view to identify the inadequacies under varied environments and to scientifically extend precise and meaningful research so that the significant outcomes including new technologies are judiciously applied for requisite productivity, profitability and sustainability of agriculture. Besides this, meticulous research in some of the very sensible and stirring areas of Plant Physiology-Plant Molecular Physiology are indispensably needed for holistic development of agriculture and crop production in different agro-climatic zones. Ardently, this is also to focus upon excellent new
ideas ensuring the best science done across the full extent of modern plant biology, in
general, and plant physiology, in particular. In Volume 14, with inventive applied research,
attempts have been made to bring together much needed eighteen remarkable review
articles distributed in three appropriate major sections of Nutriophysiology and Crop
Productivity, Plant Responses to Changing Environment and Environmental Stresses and
Technological Innovations in Agriculture written by thirty four praiseworthy contributors of
eminence in unequivocal fields mainly from premier institutions of India and abroad. In
reality, the Volume 14 of the Treatise Series is wealth for interdisciplinary exchange of
information particularly in the field of nutriophysiology and abiotic stresses for planning
meaningful research and related education programmes in these thrust areas. Apart from
fulfilling the heightened need of this kind of select edition in different volumes for research
teams and scientists engaged in various facets of research in Plant Physiology/Plant
Sciences in traditional and agricultural universities, institutes and research laboratories
throughout the world, it would be tremendously a productive reference book for acquiring
advanced knowledge by post-graduate and Ph.D. scholars in response to the innovative
courses in Plant Physiology, Plant Biochemistry, Plant Molecular Biology, Plant
Biotechnology, Environ-mental Sciences, Plant Pathology, Microbiology, Soil Science &
Agricultural Chemistry, Agronomy, Horticulture, and Botany.
Physiological Efficiency For Crop Improvement-A. Hemantaranjan 2015-07-01 Plant Physiology is in essence the foundation of plant molecular biology. This volume would be tremendously a productive reference book for acquiring advanced knowledge by faculties, post-graduate and Ph.D. scholars in response to the innovative courses in Plant Physiology & Plant Molecular Biology, Plant Biotechnology, Environmental Sciences, Plant Pathology, Microbiology, Forestry, Soil Science, Agronomy, Horticulture, and Botany.

Nanotechnology-COVID-19 Interface-Devasena T. 2021-02-04 This book highlights the role of nanotechnology concepts in the management of COVID-19 pandemic. The book covers different aspects of the causative agent SARS CoV2 (Severe Acute Respiratory Syndrome Coronavirus-2) and the COVID-19 pandemic with a special emphasis on nanotechnology. It discusses the origin and history of SARS CoV2 and the outbreak of COVID-19 and highlights the geographical mutations in the SARS CoV2 virus genome, providing information about the structural features, antigenicity and the life cycle of SARS CoV2. The book provides an insight into nanotechnology–virology interface and explains how nanomaterials link the gap between the vital phases of SARS CoV2 life cycle and the four modalities of COVID-19 management viz sensing/diagnosis, therapy, prevention and self-protection. Further, the existing and promising diagnostic tools for detection of COVID-19 are discussed with an emphasis on nano PCR, nanoimmunosensors, biobarcode
assay and point of care approach and also describe the nanoparticles involved in the CT imaging of lungs and SFHI (Spatial Frequency Heterodyne Imaging) for diagnosis of SARS COV2 infection. The book concludes with details about translational medicine and explains the types of SARS CoV2 vaccines, stages of COVID-19 vaccine development and possible nanovaccines for COVID-19, followed by the description on biopharmaceutical companies involved in the production of SARS CoV2 vaccines.

**Probiotics in Agroecosystem**- Vivek Kumar 2017-09-26 This book focuses on food security in sustainable agriculture and nutrient management. The study of plant probiotic microbes’ synergism using existing techniques has greatly improved our grasp of the structure and functioning of the plant microbiome. However, the function of plant probiotic microbes and their relation to plants’ health in the context of food security, soil nutrient management, human and plant health are largely unexplored. Compared to human probiotics, diverse types and millions of microbiota inhabit plants, forming multifaceted and complicated ecological societies that stimulate plant growth and health through their combined metabolic activities. From the perspective of sustainable cropping systems, observing plant probiotics can provide insights on how to stimulate and maintain plant productivity, along with host stress tolerance and recycling of soil nutrients. This book combines reviews and original research articles to highlight the latest advances in plant probiotics, their
specificity, diversity, function, as well as plant microbiome management to improve plant
growth and productivity, nutrient management and human health.

Applications of Targeted Nano Drugs and Delivery Systems-Shyam Mohapatra
2018-10-05 Applications of Targeted Nano-Drugs and Delivery Systems: Nanoscience and
Nanotechnology in Drug Delivery explores the applications of Nano-drugs and their delivery
systems, investigating the role they can play in key body systems and major diseases. The
book explores how nanotechnology can be deployed in developing new drug delivery
systems and how they enable pharmaceutical companies to reformulate existing drugs on
the market, thereby extending the lifetime of products and enhancing performance by
increasing effectiveness, safety and patient adherence, and ultimately reducing healthcare
cost. Reflecting the interdisciplinary nature of the subject matter, this book includes
contributions by experts from different fields. Readers will find a reference and practical
source of guidance for researchers, students and scientists working in the fields of
nanotechnology, materials science, and technology and biomedical science. Enables readers
from different fields to access recent research and protocols across traditional boundaries
Focuses on protocols and techniques, as well as the knowledge base of the field, thus
enabling those in R&D to learn about, and successfully deploy, cutting-edge techniques
Explores the applications of Nano-drugs and their delivery systems, investigating the role
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**Nanotechnology-COVID-19 Interface**-Devasena T. 2021 This book highlights the role of nanotechnology concepts in the management of COVID-19 pandemic. The book covers different aspects of the causative agent SARS CoV2 (Severe Acute Respiratory Syndrome Coronavirus-2) and the COVID-19 pandemic with a special emphasis on nanotechnology. It discusses the origin and history of SARS CoV2 and the outbreak of COVID-19 and highlights the geographical mutations in the SARS CoV2 virus genome, providing information about the structural features, antigenicity and the life cycle of SARS CoV2. The book provides an insight into nanotechnology-virology interface and explains how nanomaterials link the gap between the vital phases of SARS CoV2 life cycle and the four modalities of COVID-19 management viz sensing/diagnosis, therapy, prevention and self-protection. Further, the existing and promising diagnostic tools for detection of COVID-19 are discussed with an emphasis on nano PCR, nanoimmunosensors, biobarcode assay and point of care approach and also describe the nanoparticles involved in the CT imaging of lungs and SFHI (Spatial Frequency Hetrodyne Imaging) for diagnosis of SARS COV2 infection. The book concludes with details about translational medicine and explains the types of SARS CoV2 vaccines, stages of COVID-19 vaccine development and possible nanovaccines for COVID-19, followed by the description on biopharmaceutical companies involved in the production of SARS
CoV2 vaccines.

**Nanocarriers for Drug Delivery**-Shyam Mohapatra 2018-10-05 Nano-carriers for Drug Delivery: Nanoscience and Nanotechnology in Drug Delivery presents recent discoveries in research on the pharmaceutical applications of the various types of nanosystem-based drug delivery systems. As many nanosystems have reached the market over the past decade, this book proves their benefits to patients. It explores these new carriers and the advances in drug delivery they have facilitated. Reflecting the interdisciplinary nature of the subject matter, the book includes experts from different fields, and with various backgrounds and expertise. It will appeal to researchers and students from different disciplines, such as materials science, technology and various biomedical fields. Coverage includes industrial applications that bridge the gap between lab-based research and practical industrial use. The resulting work is a reference and practical source of guidance for researchers, students and scientists working in the fields of nanotechnology, materials science and technology and biomedical science. Enables readers from different fields to access recent research and protocols across traditional boundaries Focuses on protocols and techniques, as well as the knowledge base of the field, thus enabling those in R&D to learn about, and successfully deploy, cutting-edge techniques Includes sections on nanocarrier systems
Nanotechnology for Energy Sustainability - Baldev Raj 2017-01-27 In three handy volumes, this ready reference provides a detailed overview of nanotechnology as it is applied to energy sustainability. Clearly structured, following an introduction, the first part of the book is dedicated to energy production, renewable energy, energy storage, energy distribution, and energy conversion and harvesting. The second part then goes on to discuss nano-enabled materials, energy conservation and management, technological and intellectual property-related issues and markets and environmental remediation. The text concludes with a look at and recommendations for future technology advances. An essential handbook for all experts in the field - from academic researchers and engineers to developers in industry.

Interfaces in Particle and Fibre Reinforced Composites - Kheng Lim Goh 2019-11-27 Interfaces in Particle and Fibre-Reinforced Composites: From Macro- to Nanoscale addresses recent research findings on the particle-matrix interface at different length scales. The book's main focus is on the reinforcement of materials by particles that can result in a composite material of high stiffness and strength, but it also focuses on how the particle interacts with the (matrix) material, which may be a polymer, biological-based material, ceramic or conventional metal. The different types of particle reinforced composites are discussed, as is load transfer at the particle-matrix interface. Readers will
learn how to select materials and about particle structure. Significant progress has been made in applying these approaches, thus making this book a timely piece on recent research findings on the particle-matrix interface at different length scales. Features wide coverage, from polymer, to ceramics and metal-based particulate composites. Structured in a logical order to cover fundamental studies, computer simulations, experimental techniques and characterization.

**Multifunctional Systems for Combined Delivery, Biosensing and Diagnostics**
Alexandru Mihai Grumezescu 2017-05-03 Multifunctional Systems for Combined Delivery, Biosensing, and Diagnostics explores how multifunctional nanocarriers are being used in combined delivery and diagnostics in contemporary medicine. Particular attention is given to efforts to i) reduce the side effects of therapeutic agents, ii) increase the pharmacological effect, and iii) improve aqueous solubility and chemical stability of different therapeutic agents. The chapters focus on applications of nanostructured materials and nanocarriers, highlighting how these can be used effectively in both diagnosis and delivery. This applied focus makes the book an important reference source for those wanting to learn more about how specific nanomaterials and nanotechnology systems can help to solve drug delivery and diagnostics problems. This book is a valuable resource for materials scientists, bioengineers, and medical researchers who are looking for an applications-oriented guide on how...
Nanotechnology and nanomaterials can be used effectively throughout the medical treatment process, from diagnosis to treatment. Explores the benefits of using a variety of nanomaterials as drug delivery agents. Explains how nanocarriers can reduce the side effects of therapeutic agents. Provides an analysis of the pros and cons of using specific nanocarriers to solve particular diagnosis and delivery problems.

**Agri-Food Supply Chain Management: Breakthroughs in Research and Practice**

Management Association, Information Resources 2016-09-27 The development of a sustainable agricultural system is a critical concern for any nation in modern society. By implementing proper supply chain processes, available natural resources and food can be better utilized. Agri-Food Supply Chain Management: Breakthroughs in Research and Practice is a compendium of emerging perspectives on the development of an effective agricultural value chain and the optimization of supply chain management within the agriculture and food sectors. Highlighting theoretical frameworks, real-world applications, and future outlooks, this book is a primary reference source for professionals, students, practitioners, and managers actively involved in agricultural development.

**Physics of the Future**

Michio Kaku 2011-03-15 Imagine, if you can, the world in the year
2100. In Physics of the Future, Michio Kaku—the New York Times bestselling author of Physics of the Impossible—gives us a stunning, provocative, and exhilarating vision of the coming century based on interviews with over three hundred of the world’s top scientists who are already inventing the future in their labs. The result is the most authoritative and scientifically accurate description of the revolutionary developments taking place in medicine, computers, artificial intelligence, nanotechnology, energy production, and astronautics. In all likelihood, by 2100 we will control computers via tiny brain sensors and, like magicians, move objects around with the power of our minds. Artificial intelligence will be dispersed throughout the environment, and Internet-enabled contact lenses will allow us to access the world's information base or conjure up any image we desire in the blink of an eye. Meanwhile, cars will drive themselves using GPS, and if room-temperature superconductors are discovered, vehicles will effortlessly fly on a cushion of air, coasting on powerful magnetic fields and ushering in the age of magnetism. Using molecular medicine, scientists will be able to grow almost every organ of the body and cure genetic diseases. Millions of tiny DNA sensors and nanoparticles patrolling our blood cells will silently scan our bodies for the first sign of illness, while rapid advances in genetic research will enable us to slow down or maybe even reverse the aging process, allowing human life spans to increase dramatically. In space, radically new ships—needle-sized vessels using laser propulsion—could replace the expensive chemical rockets of today and perhaps visit nearby stars. Advances in nanotechnology may lead to the fabled space elevator, which would
propel humans hundreds of miles above the earth’s atmosphere at the push of a button. But these astonishing revelations are only the tip of the iceberg. Kaku also discusses emotional robots, antimatter rockets, X-ray vision, and the ability to create new life-forms, and he considers the development of the world economy. He addresses the key questions: Who are the winner and losers of the future? Who will have jobs, and which nations will prosper? All the while, Kaku illuminates the rigorous scientific principles, examining the rate at which certain technologies are likely to mature, how far they can advance, and what their ultimate limitations and hazards are. Synthesizing a vast amount of information to construct an exciting look at the years leading up to 2100, Physics of the Future is a thrilling, wondrous ride through the next 100 years of breathtaking scientific revolution.

A Mechanistic Approach to Medicines for Tuberculosis Nanotherapy - Rajan Mariappan 2021-03-29 A Mechanistic Approach to Medicines for Tuberculosis Nanotherapy examines drug carrier development for controlled, targeted, pH and stimuli responsive drug releases for tuberculosis. The book provides in-depth information about mycobacterium tuberculosis, tuberculosis formation, and synthetic procedures for carrier synthesis, characterizations and mechanistic approaches. Key topics include the properties and functions of nanomedicines and how they might be applied for clinical diagnosis and treatment. Emphasis is placed on the basic fundamentals, biomaterial formulations, design
principles, fabrication techniques, and transitioning bench-to-bed clinical applications. This book is useful for new researchers who focus on nanomedicine, stem cell therapy and bone tissue engineering. In addition, it introduces experienced researchers and clinicians to key trends, thus increasing their knowledge in drug discovery for tuberculosis and nanomedicine. Features the most notable uses of drug for tuberculosis treatment, including novel advances in materials Assesses new agents and chemical compounds against tuberculosis Examines the interaction of new technologies to discover ways to treat tuberculosis more effectively and efficiently

**Skin Cancer: Pathogenesis and Diagnosis**-Ashish Dwivedi 2021 This book highlights the molecular and cellular mechanisms involved in the initiation and progression of skin cancer. It also explains the role of the environment in skin cancer development and explores the potential of microbiome in the diagnosis, prevention and treatment of skin cancer. The book also presents potential biomarkers for early detection of skin cancer and discusses recent advances in skin cancer prevention and treatment using photodynamic therapy. Lastly, it summarizes the applications of biomedical engineering, non-coding and nanotechnology in the diagnosis and therapeutics in skin cancer. It is a valuable resource for investigators in the field of skin cancer, including pathologists, medical and surgical oncologists, and dermatologists.
Nanomedicine Manufacturing and Applications-Francis Verpoort 2021-06-22
Nanomedicine explores the modification and enhancement of the properties and performances of typical drugs to treat various diseases. Nano-based medicines have advantages in several ways, such as in nanotherapeutics, nanotheranostics, and nanodiagnostics. Nanomedicine Manufacturing and Applications effectively explores the major manufacturing techniques and applications of nanomaterial-based medicine in the areas of chemotherapy, biochips, insulin pumps, and other treatment methods. This book explains how nanomedicines are developed from nanoparticles as well as their biomedical and other applications related to healthcare. This book is an important reference source for nanoscientists, biomaterials scientists, and biomedical engineers who want to learn more about how nano-based medicines are made and used. Outlines the process of making nanomedicine as well as nanodrug carriers, with a focus on nanomedicine for cancer treatment. Explains the formulation and manufacturing process of nanomedicines, showing how to build these materials. Demonstrates how nano-based medicines are being used to tackle a range of diseases in a way that conventional medicines cannot.
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