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E93 - TANIYA MONICA

Preceded by Neurobiology of disease / edited by Sid Gilman. 2007.

The introduction of contaminants, due to rapid urbanization and anthropogenic activities into the environment, causes distress to the physio-chemical systems including living organisms, which possibly is threatening the dynamics of nature as well as the soil biology by producing certain xenobiotics. Hence, there is an immediate global demand for the diminution of such contaminants and xenobiotics that can otherwise adversely affect the living organisms. Some toxic xenobiotics include synthetic organochlorides such as PAHs and some fractions of crude oil and coal. Over time, microbial remediation processes have been accelerated to produce better, more eco-friendly, and more biodegradable solutions for complete dissemination of these xenobiotic compounds. The advancements in microbiology and biotechnology led to the launch of microbial biotechnology as a separate area of research and contributed dramatically to the development of areas like agriculture, environment, biopharmaceutics, fermented foods, and more. The Handbook of Research on Microbial Remediation and Microbial Biotechnology for Sustainable Soil provides a detailed comprehensive account for microbial treatment technologies, bioremediation strategies, biotechnology, and the important microbial species involved in remediation. The chapters focus on recent developments in microbial biotechnology in the areas of agriculture and environment and the physiology, biochemistry, and the mechanisms of remediation along with a future outlook. This book is ideal for scientists, biologists, academicians, students, and researchers in the fields of life sciences, microbiology, environmental science, environmental engineering, biotechnology, agriculture, and health sciences.

This book includes 19 chapters contributed by the world's leading experts on pretreatment methods for biomass. It extensively covers the different types of biomass (e.g. molasses, sugar beet pulp, cheese whey, sugarcane residues, palm waste, vegetable oil, straws, stalks and wood), various pretreatment approaches (e.g. physical, thermal, chemical, physicochemical and biological) and methods that show the subsequent production of biofuels and chemicals such as sugars, ethanol, extracellular polysaccharides, biodiesel, gas and oil. In addition to traditional methods such as steam, hot-water, hydrothermal, diluted-acid, organosolv, ozonolysis, sulfite, milling, fungal and bacterial, microwave, ultrasonic, plasma, torrefaction, pelletization, gasification (including biogas) and liquefaction pretreatments, it also introduces and discusses novel techniques such as nano and solid catalysts, organic electrolyte solutions and ionic liquids. This book offers a review of state-of-the-art research and provides guidance for the future paths of developing pretreatment techniques of biomass for biofuels, especially in the fields of biotechnology, microbiology, chemistry, materials science and engineering. It intends to provide a systematic introduction of pretreatment techniques. It is an accessible reference work for students, researchers, academicians and industrialists in biorefineries. Zhen Fang is a Professor of Bioenergy and the leader and founder of the biomass group at the Xishuangbanna Tropical Botanical Garden of the Chinese Academy of Sciences. He is also an adjunct full Professor of Life Sciences at the University of Science and Technology of China.

Liposomal Encapsulation in Food Science and Technology provides all the possible applications of liposomes in food and allied systems, along with recent advances made in these fields. This helps researchers in food science and technology, as well as those in interdisciplinary fields, better explore the opportunities that liposomal encapsulation offers. Among other topics, the book covers formulation and characterization of liposome, liposome mediated encapsulation of antimicrobials and probiotics, liposome-assisted delivery of enzymes and proteins, and liposome for delivery of dietary nutrients and nutraceuticals, etc. This approach facilitates building better dedicated or tandem approaches in respective fields for process/product development. Written by an international team of contributors, the book will aid academicians in developing more industry useful tools/techniques/products. Brings a broader overview of different modules of liposomal encapsulation of bioactive food supplements Provides all the possible applications of liposomes in food and allied systems, along with recent advances made in these fields Includes chemical, physical, medical and stability related chapters This book describes the multiple aspects of (i) preparation of the magnetic core, (ii) the stabilization with different coatings, (iii) the physico-chemical characterization and (iv) the vectorization to obtain specific nanosystems. Several bio-applications are also presented in this book. In the early days of Magnetic Resonance Imaging (MRI), paramagnetic ions were proposed as contrast agents to enhance the diagnostic quality of MR images. Since then, academic and industrial efforts have been devoted to the development of new and more efficient molecular, supramolecular and nanoparticulate systems. Old concepts and theories, like paramagnetic relaxation, were revisited and exploited, leading to new scientific tracks. With their high relaxivity payload, the superparamagnetic nanoparticles are very appealing in the context of molecular imaging but challenges are still numerous: absence of toxicity, specificity, ability to cross the biological barriers, etc.

Industrial Biorefineries and White Biotechnology provides a comprehensive look at the increasing focus on developing the processes and technologies needed for the conversion of biomass to liquid and gaseous fuels and chemicals, in particular, the development of low-cost technologies. During the last 3-4 years, there have been scientific and technological developments in the area; this book represents the most updated information and technological perspective on the topic. Provides information on the most advanced and innovative pretreatment processes and technologies for biomass Covers information on lignocellulosic and algal biomass to work on the principles of biorefinery Provides information on integration of processes for the pretreatment of biomass Designed as a textbook for both graduate students and researchers

This volume provides an abundance of valuable information on emerging eco-friendly technology and its potential role in combating climate change via agroforestry. The volume begins by describing the recent understanding of the scenario of climate change and its issues and challenges and pro-

vides an in-depth analysis of the potential of agroforestry toward climate change mitigation and adaptation. Chapters address a wide range of techniques and methods for mitigating the negative aspects of climate change through agroforestry, such as vermicomposting, carbon sequestration, horticulture techniques, nutrient sequestration and soil sustainability, conservation of medicinal plant resources, silvipastoral systems, phytoremediation techniques, and more. The book also looks at livelihood security and the role of agroforestry. Key features: Provides updated information and recent developments in the field of climate change and agroforestry Looks at a variety of eco-friendly methods being employed to help mitigate climate change through agroforestry Provides recommendations and suggestions to build harmony between agroforestry and climate change Discusses new insights on the role of agroforestry toward combating climate change as well as maintaining the sustainability of ecosystems

This book explores the use of mobile devices for teaching and learning language and literacies, investigating the ways in which these technologies open up new educational possibilities. Pegrum builds up a rich picture of contemporary mobile learning and outlines of likely future developments.

An excellent, concise, and interdisciplinary overview of different classes of emerging pollutants arising, for example, from pharmaceuticals, pesticides, personal care products, and industrial chemicals and their impact on water, soil, and air. Following an introduction to chemical pollutants, with special attention focused on organic compounds and their properties, the book goes on to describe major emerging pollutants grouped according to their applications in different sectors of industrial or economic activity. For each type of compound, the chemical structure, main properties, and source are presented, along with their fate in the environment as pollutants, the latest analytical methods for detection, possible health or ecology consequences, as well as current regulatory laws. New developments, such as nanotechnology as a pollution source, are also included. The book closes with a chapter devoted to conclusions and future perspectives.

This book collects chapters on different theoretical and experimental aspects of photonics crystals for Nanophotonics applications. It is divided in two parts - a theoretical section and an experimental and applicative section. The first part includes chapters developing several numerical methods for analysis and design of photonic crystal devices, such as 2D ring resonators for filters, single and coupled nanobeam cavities, birefringence in photonic crystal cavities, threshold analysis in photonic crystal lasers, gap solitons in photonic crystals, novel photonic atolls, dynamic characteristics of photonic crystal filters. The second part focuses on some aspects of photonic crystals fabrication and relevant applications, such as nitrogen defect technology in diamond, silicon nitride free standing membranes, photonic crystals structures in silicon, photonic crystals for optical sensing.

Handbook of Pharmacogenomics and Stratified Medicine is a comprehensive resource to understand this rapidly advancing field aiming to deliver the right drug at the right dose to the right patient at the right time. It is designed to provide a detailed, but accessible review of the entire field from basic principles to applications in various diseases. The chapters are written by international experts to allow readers from a wide variety of backgrounds, clinical and non-clinical (basic geneticists, pharmacologists, clinicians, trialists, industry personnel, ethicists) to understand the principles underpinning the progress in this area, the successes, failures and the challenges ahead. To be accessible to the widest range of readers, the clinical application section introduces the disease process, existing therapies, followed by pharmacogenomics and stratified medicine details. Medicine is the cornerstone of modern therapeutics prescribed on the basis that its benefit should outweigh its risk. It is well known that people respond differently to medications and in many cases the risk-benefit ratio for a particular drug may be a gray area. The last decade has seen a revolution in genomics both in terms of technological innovation and discovering genetic markers associated with disease. In parallel there has been steady progress in trying to make medicines safer and tailored to the individual. This has occurred across the whole spectrum of medicine, some more than others. In addition there is burgeoning interest from the pharmaceutical industry to leverage pharmacogenomics for more effective and efficient clinical drug development. Provides clinical and non-clinical researchers with practical information normally beyond their usual areas of research or expertise Includes an basic principles section explaining concepts of basic genetics, genetic epidemiology, bioinformatics, pharmacokinetics and pharmacodynamics Covers newer technologies- next generation sequencing, proteomics, metabolomics Provides information on animal models, lymphoblastoid cell lines, stem cells Provides detailed chapters on a wide range of disease conditions, implementation and regulatory issues Includes chapters on the global implications of pharmacogenomics

Handbook of Nanomaterials for Industrial Applications explores the use of novel nanomaterials in the industrial arena. The book covers nanomaterials and the techniques that can play vital roles in many industrial procedures, such as increasing sensitivity, magnifying precision and improving production limits. In addition, the book stresses that these approaches tend to provide green, sustainable solutions for industrial developments. Finally, the legal, economical and toxicity aspects of nanomaterials are covered in detail, making this is a comprehensive, important resource for anyone wanting to learn more about how nanomaterials are changing the way we create products in modern industry. Demonstrates how cutting-edge developments in nanomaterials translate into real-world innovations in a range of industry sectors Explores how using nanomaterials can help engineers to create innovative consumer products Discusses the legal, economical and toxicity issues arising from the industrial applications of nanomaterials

Advances in multimedia communication systems have enhanced the need for improved video coding standards. Due to the inherent nature of video content, large bandwidths and reliable communication links are required to ensure a satisfactory level of quality experience; inspiring industry and research communities to concentrate their efforts in this emerging research area. Multimedia Networking and Coding covers widespread knowledge and research as well as innovative applications in multimedia communication systems. This book highlights recent techniques that can evolve into future

multimedia communication systems, also showing experimental results from systems and applications.

The field of polymer nanocomposites has become essential for engineering and military industries over the last few decades as it applies to computing, sensors, biomedical microelectronics, hard coating, and many other domains. Due to their outstanding mechanical and thermal features, polymer nanocomposite materials have recently been developed and now have a wide range of applications. *Polymer Nanocomposites for Advanced Engineering and Military Applications* provides emerging research on recent advances in the fabrication methods, properties, and applications of various nanofillers including surface-modification methods and chemical functionalization. Featuring coverage on a broad range of topics such as barrier properties, biomedical microelectronics, and matrix processing, this book is ideally designed for engineers, industrialists, chemists, government officials, military professionals, practitioners, academicians, researchers, and students.

"Infogest" (Improving Health Properties of Food by Sharing our Knowledge on the Digestive Process) is an EU COST action/network in the domain of Food and Agriculture that will last for 4 years from April 4, 2011. Infogest aims at building an open international network of institutes undertaking multidisciplinary basic research on food digestion gathering scientists from different origins (food scientists, gut physiologists, nutritionists...). The network gathers 70 partners from academia, corresponding to a total of 29 countries. The three main scientific goals are: Identify the beneficial food components released in the gut during digestion; Support the effect of beneficial food components on human health; Promote harmonization of currently used digestion models. Infogest meetings highlighted the need for a publication that would provide researchers with an insight into the advantages and disadvantages associated with the use of respective *in vitro* and *ex vivo* assays to evaluate the effects of foods and food bioactives on health. Such assays are particularly important in situations where a large number of foods/bioactives need to be screened rapidly and in a cost effective manner in order to ultimately identify lead foods/bioactives that can be the subject of *in vivo* assays. The book is an asset to researchers wishing to study the health benefits of their foods and food bioactives of interest and highlights which *in vitro/ex vivo* assays are of greatest relevance to their goals, what sort of outputs/data can be generated and, as noted above, highlight the strengths and weaknesses of the various assays. It is also an important resource for undergraduate students in the 'food and health' arena.

This thoroughly updated 4th Edition of this highly regarded text continues to provide the latest therapeutic and surgical information on nail disease and disorders. It expands and updates all areas of onychology, including the newest in diagnostic techniques for nail diseases, a segment of dermatology that not only proves more difficult than cutaneous disorders but also is an exciting and innovative area on the frontier of skin research. *Scher and Daniel's Nails: Diagnosis, Surgery, Therapy* provides an update of therapeutic advances to help the resident, practitioner, and related healthcare provider (podiatrist, nurse, primary care physician, and all involved in nail care). A major section is devoted to nail surgery and nail pathology, both of which have been behind compared to other aspects of dermatology. There is also extensive information on the billion dollar nail cosmetics industry, which will bring this text to the attention of all nail technicians (several hundred thousand in the US alone) as well as to cosmeticians and manufacturers.

This book is dedicated to label-free, non-invasive monitoring of cell-based assays and it comprises the most widely applied techniques. Each approach is described and critically evaluated by an expert in the field such that researchers get an overview on what is possible and where the limitations are. The book provides the theoretical basis for each technique as well as the most successful and exciting applications. Label-free bioanalytical techniques have been known for a long time as valuable tools to monitor adsorption processes at the solid-liquid interface in general - and biomolecular interaction analysis (BIA) in particular. The underlying concepts have been progressively transferred to the analysis of cell-based assays. The strength of these approaches is implicitly given with the name 'label-free': the readout is independent of any label, reagent or additive that contaminates the system under study and potentially affects its properties. Thus, label-free techniques provide an unbiased analytical perspective in the sense that the sample is not manipulated by additives but pure. They are commonly based on physical principles and read changes in integral physical properties of the sample like refractive index, conductivity, capacitance or elastic modulus to mention just a few. Even though it is not implied in the name, label-free approaches usually monitor the cells under study non-invasively meaning that the amplitude of the signal (e.g. electric field strength, mechanical elongation) that is used for the measurement is too low to interfere or affect. In contrast to label-based analytical techniques that are commonly restricted to a single reading at a predefined time point, label-free approaches allow for a continuous observation so that the dynamics of the biological system or reaction become accessible.

This book provides a thorough introduction to the essential topics in modern materials science. It brings together the spectrum of materials science topics, spanning inorganic and organic materials, nanomaterials, biomaterials, and alloys within a single cohesive and comprehensive resource. Synthesis and processing techniques, structural and crystallographic configurations, properties, classifications, process mechanisms, applications, and related numerical problems are discussed in each chapter. End-of-chapter summaries and problems are included to deepen and reinforce the reader's comprehension. Provides a cohesive and comprehensive reference on a wide range of materials and processes in modern materials science; Presents material in an engaging manner to encourage innovative practices and perspectives; Includes chapter summaries and problems at the end of every chapter for reinforcement of concepts.

Machine learning and optimization techniques are revolutionizing our world. Other types of information technology have not progressed as rapidly in recent years, in terms of real impact. The aim of this book is to present some of the innovative techniques in the field of optimization and machine learning, and to demonstrate how to apply them in the fields of engineering. *Optimization and Machine Learning* presents modern advances in the selection, configuration and engineering of algorithms that rely on machine learning and optimization. The first part of the book is dedicated to applications where optimization plays a major role, and the second part describes and implements several applications that are mainly based on machine learning techniques. The methods addressed in these chapters are compared against their competitors, and their effectiveness in their chosen field of application is illustrated.

Magnetic Nanoparticles in Human Health and Medicine Explores the application of magnetic nanoparticles in drug delivery, magnetic resonance imaging, and alternative cancer therapy. *Magnetic Nanoparticles in Human Health and Medicine* addresses recent progress in improving diagnosis by magnetic resonance imaging (MRI) and using non-invasive and non-toxic magnetic nanoparticles for targeted drug delivery and magnetic hyperthermia. Focusing on cancer diagnosis and alternative therapy, the book covers both fundamental principles and advanced theoretical and experimental research on the magnetic properties, biocompatibilization, biofunctionalization, and application of magnetic nanoparticles in nanobiotechnology and nanomedicine. Chapters written by a panel of international specialists in the field of magnetic nanoparticles and their applications in biomedicine cover magnetic hyperthermia (MHT), MRI contrast agents, biomedical imaging, modeling and simulation, nanobiotechnology, toxicity issues, and more. Readers are provided with accurate information on the use of magnetic nanoparticles in diagnosis, drug delivery, and alternative cancer therapeutics—featuring discussion of current problems, proposed solutions, and future research directions. Topics include current applications of magnetic iron oxide nanoparticles in nanomedicine and alternative cancer therapy: drug delivery, magnetic resonance imaging, superparamagnetic hyperthermia as alternative cancer therapy, magnetic hyperthermia in clinical trials, and simulating the physics of magnetic particle heating for cancer therapy. This comprehensive volume: Covers both general research on magnetic nanoparticles in medicine and specific applications in cancer therapeutics. Discusses the use of magnetic nanoparticles in alternative cancer therapy by magnetic and superparamagnetic hyperthermia. Explores targeted medication delivery using magnetic nanoparticles as a future replacement of conventional techniques. Reviews the use of MRI with magnetic nanoparticles to increase the diagnostic accuracy of medical imaging. *Magnetic Nanoparticles in Human Health and Medicine* is a valuable resource for researchers in the fields of nanomagnetism, magnetic nanoparticles, nanobiomaterials, nanobioengineering, biopharmaceuticals, nanobiotechnologies, nanomedicine, and biopharmaceuticals, particularly those focused on alternative cancer diagnosis and therapeutics.

Polymers in Organic Electronics: Polymer Selection for Electronic, Mechatronic, and Optoelectronic Systems provides readers with vital data, guidelines, and techniques for optimally designing organic electronic systems using novel polymers. The book classifies polymer families, types, complexes, composites, nanocomposites, compounds, and small molecules while also providing an introduction to the fundamental principles of polymers and electronics. Features information on concepts and optimized types of electronics and a classification system of electronic polymers, including piezoelectric and pyroelectric, optoelectronic, mechatronic, organic electronic complexes, and more. The book is designed to help readers select the optimized material for structuring their organic electronic system. Chapters discuss the most common properties of electronic polymers, methods of optimization, and polymeric-structured printed circuit boards. The polymeric structures of optoelectronics and photonics are covered and the book concludes with a chapter emphasizing the importance of polymeric structures for packaging of electronic devices. Provides key identifying details on a range of polymers, micro-polymers, nano-polymers, resins, hydrocarbons, and oligomers. Covers the most common electrical, electronic, and optical properties of electronic polymers. Describes the underlying theories on the mechanics of polymer conductivity. Discusses polymeric structured printed circuit boards, including their rapid prototyping and optimizing their polymeric structures. Shows optimization methods for both polymeric structures of organic active electronic components and organic passive electronic components.

This book provides the latest research on bioethanol production from first- and second- generation feedstock. Bioethanol has emerged as one of the main alternative biofuels in recent years. The book provides a perspective on the chemistry, sources and production of bioethanol highlighting the recent developments in the field. Through this book readers will learn basic and advanced bioethanol production technologies under one roof, including resource management and environmental and economic impacts. The topics discussed in the book will attract researchers and scholars focusing in this field as well as anyone who is interested in green and sustainable energy resources.

In this issue of *Hematology/Oncology Clinics*, guest editors Drs. Sophie Lanzkron and Jane Little bring their considerable expertise to the topic of Sickle Cell Syndromes. Top experts in the field cover key topics such as structural racism and impact on sickle cell disease (SCD); pathophysiology and biomarkers of SCD; genetic modifiers of SCD; allogeneic transplant and gene therapy: reproductive health; chronic pain; and more. Contains 16 relevant, practice-oriented topics including innovative therapies, addressing challenging complications, novel science on mechanisms of disease; preventing cognitive decline in people with SCD; quality of life in SCD; and more. Provides in-depth clinical reviews on sickle cell syndromes, offering actionable insights for clinical practice. Presents the latest information on this timely, focused topic under the leadership of experienced editors in the field. Authors synthesize and distill the latest research and practice guidelines to create clinically significant, topic-based reviews.