Environmental Microbiology Maier Elsevier

Heavy Metals in SoilsAutomation: Genomic and Functional AnalysesTextbook of Environmental MicrobiologyEcology and Classification of North American Freshwater InvertebratesEnvironmental and Pollution ScienceYogurt in Health and Disease PreventionCoronavirusesEncyclopedia of Food and HealthFundamentals of Ecosystem ScienceCytokine Storm SyndromeCurrent Developments in Biotechnology and BioengineeringEncyclopedia of Biological InvasionsAutophagyMicrobial Inhabitants of HumansHandbook of Water and Wastewater MicrobiologyAnalytical GeomicrobiologyEnvironmental MicrobiologyTextbook of Respiratory MedicineMicrobes and Microbial TechnologyField Testing of USEPA Methods 1601 and 1602 for Coliphage in GroundwaterDevelopment and EnvironmentAlgal Culturing TechniquesEnvironmental Monitoring and CharacterizationBioremediation and BiotechnologyEnvironmental MicrobiologyEnvironmental Microbiology of Aquatic and Waste SystemsBiosolids Applied to LandBiofilm InfectionsGreen Bio-processesEnvironmental MicrobiologyManaging Ocean Environments in a Changing ClimateAcademic E-BooksPollution ScienceEnvironmental and Pollution ScienceThe Fungal KingdomMicroorganisms for Green RevolutionThe Perfect SlimeMolecular Biology and Genetic EngineeringMicrobiological Analysis of Food and WaterSustainable Development of Algal Biofuels in the United States

Heavy Metals in Soils

This book places the main actors in environmental microbiology, namely the microorganisms, on center stage. Using the modern approach of 16S ribosomal RNA, the book looks at the taxonomy of marine and freshwater bacteria, fungi, protozoa, algae, viruses, and the smaller aquatic animals such as nematodes and rotifers, as well as at the study of unculturable aquatic microorganisms (metagenomics). The peculiarities of water as an environment for microbial growth, and the influence of aquatic microorganisms on global climate and global recycling of nitrogen and sulphur are also examined. The pollution of water is explored in the context of self-purification of natural waters. Modern municipal water purification and disease transmission through water are discussed. Alternative methods for solid waste disposal are related to the economic capability of a society. Viruses are given special attention. By focusing on the basics, this primer will appeal across a wide range of disciplines.

Automation: Genomic and Functional Analyses

A comprehensive handbook outlining state-of-the-art analytical techniques used in geomicrobiology, for advanced students, researchers and professional scientists.

Textbook of Environmental Microbiology

Automation is the major future trend for many areas in microbiology, molecular biology, and biochemistry, among other disciplines. It is an enormously exciting area, where techniques and assays that were once repetitive, tedious, and time consuming can be performed robotically, liberating the time of researchers and hospital laboratory workers for more interesting work. Many techniques have now been automated and often miniaturized, including PCR analysis, DNA/RNA preparation, diagnostic test (e.g., Pap tests), compound screening, and of course, sequencing. Some major advances, notably in Professor Leroy Hood's group, have resulted in the ability to perform thousands of assays simultaneously on a normal microscope slide. Automation, edited by two of the leading experts in the field, presents the very latest experimental techniques explained in detail. This book has succeeded in bringing together researchers at the forefront of clone library construction, genome analysis, sequencing, computational data evaluation and functional analysis, to provide insight into this "new age" of research based on genomic and chemical screening. Describes automated procedures used in microbiology and molecular biology Includes developments in robotics and vision systems Features automation in library picking, presentation and analysis Discusses paralogous duplications in microbial genomes Covers deciphering genomes through automated large-scale sequencing Describes and stresses the need for functional analyses

Internationally acclaimed contributors, including Professor Leroy Hood

Ecology and Classification of North American Freshwater Invertebrates

This volume discusses recent advancements to the age old practice of using microbial enzymes in the preparation of food. Written by leading experts in the field, it discusses novel enzymes and their applications in the industrial preparation of food to improve taste and texture, while reducing cost and increasing consistency. This book will be of interest to both researchers and students working in food technology.

Environmental and Pollution Science

The bestselling reference on environmental microbiology—now in a new edition This is the long-awaited and much-anticipated revision of the bestselling text and reference. Based on the latest information and investigative techniques from molecular biology and genetics, this Second Edition offers an in-depth examination of the role of microbiological processes related to environmental deterioration with an emphasis on the detection and control of environmental contaminants. Its goal is to further our understanding of the complex microbial processes underlying environmental degradation, its detection and control, and ultimately, its prevention. Features new to this edition include: A completely new organization with topics such as pathogens in

developing countries, effects of genetically modified crops on microbial communities, and transformations of toxic metals Comprehensive coverage of key topics such as bacteria in the greenhouse and low-energy waste treatment New coverage relating core book content to local, regional, and global environmental problems Environmental Microbiology, Second Edition is essential reading for environmental microbiologists and engineers, general environmental scientists, chemists, and chemical engineers who are interested in key current subjects in environmental microbiology. It is also appropriate as a textbook for courses in environmental science, chemistry, engineering, and microbial ecology at the advanced undergraduate and graduate levels.

Yogurt in Health and Disease Prevention

Environmental Monitoring and Characterization is an integrated, hands-on resource for monitoring all aspects of the environment. Sample collection methods and relevant physical, chemical and biological processes necessary to characterize the environment are brought together in twenty chapters which cover: sample collection methods, monitoring terrestrial, aquatic and air environments, and relevant chemical, physical and biological processes and contaminants. This book will serve as an authoritative reference for advanced students and environmental professionals. Examines the integration of physical, chemical, and biological processes Emphasizes field methods and real-time data acquisition, made more accessible with case studies, problems, calculations,

and questions Includes four color illustrations throughout the text Brings together the concepts of environmental monitoring and site characterization

Coronaviruses

For microbiology and environmental microbiology courses, this leading textbook builds on the academic success of the previous edition by including a comprehensive and up-to-date discussion of environmental microbiology as a discipline that has grown in scope and interest in recent years. From environmental science and microbial ecology to topics in molecular genetics, this edition relates environmental microbiology to the work of a variety of life science, ecology, and environmental science investigators. The authors and editors have taken the care to highlight links between environmental microbiology and topics important to our changing world such as bioterrorism and national security with sections on practical issues such as bioremediation, waterborne pathogens, microbial risk assessment, and environmental biotechnology. WHY ADOPT THIS EDITION? New chapters on: Urban Environmental Microbiology Bacterial Communities in Natural Ecosystems Global Change and Microbial Infectious Disease Microorganisms and Bioterrorism Extreme Environments (emphasizing the ecology of these environments) Aquatic Environments (now devoted to its own chapter- was combined with Extreme Environments) Updates to Methodologies: Nucleic Acid -Based Methods: microarrays, phyloarrays, real-time PCR, metagomics, and comparative genomics

Physiological Methods: stable isotope fingerprinting and functional genomics and proteomics-based approaches Microscopic Techniques: FISH (fluorescent in situ hybridization) and atomic force microscopy Cultural Methods: new approaches to enhanced cultivation of environmental bacteria Environmental Sample Collection and Processing: added section on air sampling

Encyclopedia of Food and Health

Biofuels made from algae are gaining attention as a domestic source of renewable fuel. However, with current technologies, scaling up production of algal biofuels to meet even 5 percent of U.S. transportation fuel needs could create unsustainable demands for energy, water, and nutrient resources. Continued research and development could yield innovations to address these challenges, but determining if algal biofuel is a viable fuel alternative will involve comparing the environmental, economic and social impacts of algal biofuel production and use to those associated with petroleum-based fuels and other fuel sources. Sustainable Development of Algal Biofuels was produced at the request of the U.S. Department of Energy.

Fundamentals of Ecosystem Science

This fully revised and well-documented new edition of the field's standard reference integrates the latest information on the scientific basis of respiratory medicine with its current practice. The text details the

scientific principles of respiratory medicine and its foundation in basic anatomy, physiology, pharmacology, pathology, and immunology to provide a rationale and scientific approach to the more specialised clinical material covered in subsequent sections.

Cytokine Storm Syndrome

"Addresses all aspects of this subject at a global level--including invasions by animals, plants, fungi, and bacteria--in succinct, alphabetically arranged articles. Featuring many cross-references, suggestions for further reading, illustrations, an appendix of the world's worst 100 invasive species, a glossary, and more "--The publisher.

Current Developments in Biotechnology and Bioengineering

Current Developments in Biotechnology and Bioengineering: Environmental and Health Impact of Hospital Wastewater narrates the origin (history) of pharmaceuticals discoveries, hospital wastewater and its environmental and health impacts. It covers microbiology of hospital wastewater (pathogens, multi-drug resistance development, microbial evolution and impacts on humans, animals, fish), advanced treatment options (including biological, physical and chemical methods), and highlights aspects required during hospital wastewater treatment processes. This book provides an amalgamation of all recent scientific information on hospital wastewater which is not

available in the current literature. Introduces physical, chemical and molecular testing methods for the analysis and characterization of hospital wastewater Discusses the environmental impact and health hazards of hospital wastewater Describes the microbiological aspects of the hospital wastewater, like microbial community, metagenomics, pathogens, VBNC and mechanism of antibiotic resistance development Explains hospital wastewater and its role in microbial evolution Highlights future treatment options, guidelines and drug disposal tactics

Encyclopedia of Biological Invasions

This book explores basic and applied aspects of microorganisms, which have a unique ability to cope with abiotic stresses such as drought, salinity and changing climate, as well as biodegrader microorganisms and their functional roles. Further, readers will find detailed information on all aspects that are required to make a microbe “agriculturally beneficial.” The book’s primary focus is on microbes that are essentially “hidden miniature packages of nature” that influence agro-ecosystems. Inviting papers by prominent national and international scientists working in the field of agricultural microbiology, it addresses the biogdegrader group of microbial inoculants. Each chapter covers the respective mechanism of action and recent advances in agricultural microbiology. In addition, the book especially highlights innovations involving agriculturally beneficial microorganisms, including strategies for coping with a changing climate, and

methods for developing microbial inoculants and promoting climate-smart agriculture. The information presented here is based on the authors' extensive experience in the subject area, gathered in the course of their careers in the field of agricultural microbiology. The book offers a valuable resource for all readers who are actively involved in research on agriculturally beneficial microorganisms. In addition, it will help prepare readers for the future challenges that climate change will pose for agriculture and will help to bridge the current gaps between different scientific communities.

Autophagy

This detailed new edition provides a comprehensive collection of protocols applicable to all members of the Coronavirinae sub-family currently and that are also transferrable to other fields of virology. Beginning with a section on detection, discovery, and evolution, the volume continues with coverage of propagation and titration of coronaviruses, genome manipulation, study of virus-host interactions, as well as imaging coronavirus infections. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Coronaviruses: Methods and Protocols, Second Edition serves as a valuable guide to researchers working to identify and control viruses with increased potential to

cross the species barrier and to develop the diagnostics, vaccines, and antiviral therapeutics that are required to manage future outbreaks in both humans and animals.

Microbial Inhabitants of Humans

This study evaluates these two newly developed USEPA coliphage methods, which are under consideration for approval as required by the Groundwater Rule (GWR). Method 1601 is a qualitative two-step presence-absence procedure and Method 1602 is a quantitative single agar layer (SAL) procedure. This evaluation reports on their assessment of these methods for testing the vulnerability of groundwater for viral/fecal contamination as used for routine monitoring.

Handbook of Water and Wastewater Microbiology

This advanced textbook provides a unique overview of the microbial communities (normal indigenous microbiota) inhabiting those regions of the human body that are exposed to the external environment, including the skin, eyes, oral cavity and the respiratory, urinary, reproductive and gastrointestinal tracts. In order to understand why particular organisms are able to colonise an anatomical region and why the resulting microbial community has a particular composition, an ecological approach is essential. Consequently, the key anatomical and physiological characteristics of each body site are

described throughout the book. The crucial roles of the indigenous microbiota in protecting against exogenous pathogens, regulating the development of our immune system and mucosae, and providing nutrients are also discussed. The involvement of these organisms in infections of healthy and debilitated individuals are discussed throughout and methods of manipulating the composition of the indigenous microbiota for the benefit of human health are also described.

Analytical Geomicrobiology

Algal Culturing Techniques is a comprehensive reference on all aspects of the isolation and cultivation of marine and freshwater algae, including seaweeds. It is divided into seven parts that cover history, media preparation, isolation and purification techniques, mass culturing techniques, cell counting and growth measurement techniques, and reviews on topics and applications of algal culture techniques for environmental investigations. Algal Culturing Techniques was developed to serve as both a new textbook and key reference for phycologists and others studying aquatic systems, aquaculture and environmental sciences. Students of algal ecology, marine botany, marine phycology, and microbial ecology will enjoy the hands-on methodology for culturing a variety of algae from fresh and marine waters. Researchers in industry, such as aquaculture, pharmaceutical, foodstuffs, and biotechnology companies will find an authoritative and comprehensive reference. * Sponsored by the

Phycological Society of America * Features color photographs and illustrations throughout * Describes culturing methods ranging from the test tube to outdoor ponds and coastal seaweed farms * Details isolation techniques ranging from traditional micropipette to automated flow cytometeric methods * Includes purification, growth, maintenance, and cryopreservation techniques * Highlights methods for estimating algal populations, growth rates, isolating and measuring algal pigments, and detecting and culturing algal viruses * Features a comprehensive appendix of nearly 50 algal culture medium recipes * Includes a glossary of phycological terms

Environmental Microbiology

Textbook of Respiratory Medicine

Cytokine Storm Syndromes, including HLH and MAS, are frequently fatal disorders, particularly if not recognized early and treated during presentation. The genetics of Cytokine Storm Syndromes are being defined with many of the risk alleles giving rise to mutations in the perforin-mediated cytolytic pathway used by CD8 cytotoxic T cells and natural killer cells. These are being studied using murine models. Up to 10% of the general population may carry risk alleles for developing Cytokine Storm Syndromes, and Cytokine Storm Syndromes are being increasingly recognized around the world in pediatric and adult hospitals. A variety of infectious, rheumatic, and oncologic triggers are commonly associated with

Cytokine Storm Syndromes, but understanding this disorder is critical for all researchers and physicians to ensure timely and appropriate therapy. This textbook, the first of its kind, addresses all aspects of the disorder – from genetics, pathophysiology, and ongoing research, to clinical presentations, risk factors, and treatment.

Microbes and Microbial Technology

The 1993 regulation (Part 503 Rule) governing the land application of biosolids was established to protect public health and the environment from reasonably anticipated adverse effects. Included in the regulation are chemical pollutant limits, operational standards designed to reduce pathogens and the attraction of disease vectors, and management practices. This report from the Board on Environmental Studies and Toxicology evaluates the technical methods and approaches used by EPA to establish those standards and practices, focusing specifically on human health protection. The report examines improvements in risk-assessment practices and advances in the scientific database since promulgation of the regulation, and makes recommendations for addressing public health concerns, uncertainties, and data gaps about the technical basis of the biosolids standards.

Field Testing of USEPA Methods 1601 and 1602 for Coliphage in Groundwater

Yogurt in Health and Disease Prevention examines the

mechanisms by which yogurt, an important source of micro- and macronutrients, impacts human nutrition, overall health, and disease. Topics covered include yogurt consumption's impact on overall diet quality, allergic disorders, gastrointestinal tract health, bone health, metabolic syndrome, diabetes, obesity, weight control, metabolism, age-related disorders, and cardiovascular health. Modifications to yogurt are also covered in scientific detail, including altering the protein to carbohydrate ratios, adding n-3 fatty acids, phytochemical enhancements, adding whole grains, and supplementing with various micronutrients. Prebiotic, probiotic, and synbiotic yogurt component are also covered to give the reader a comprehensive understanding of the various impacts yogurt and related products can have on human health. Health coverage encompasses nutrition, gastroenterology, endocrinology, immunology, and cardiology Examines novel and unusual yogurts as well as popular and common varieties Covers effects on diet, obesity, and weight control Outlines common additives to yogurts and their respective effects Reviews prebiotics, probiotics, and symbiotic yogurts Includes practical information on how yogurt may be modified to improve its nutritive value

Development and Environment

"Access to safe water is a fundamental human need and therefore a basic human right" --Kofi Annan, United Nations Secretary General Edited by two world-renowned scientists in the field, The Handbook of Water and Wastewater Microbiology provides a

definitive and comprehensive coverage of water and wastewater microbiology. With contributions from experts from around the world, this book gives a global perspective on the important issues faced in the provision of safe drinking water, the problems of dealing with aquatic pollution and the processes involved in wastewater management. Starting with an introductory chapter of basic microbiological principles, The Handbook of Water and Wastewater Microbiology develops these principles further, ensuring that this is the essential text for process engineers with little microbiological experience and specialist microbiologists alike. Comprehensive selection of reviews dealing with drinking water and aquatic pollution Provides an understading of basic microbiology and how it is applied to engineering process solutions Suitable for all levels of knowledge in microbiology -from those with no background to specialists who require the depth of information

Algal Culturing Techniques

This third edition of the book has been completely re-written, providing a wider scope and enhanced coverage. It covers the general principles of the natural occurrence, pollution sources, chemical analysis, soil chemical behaviour and soil-plant-animal relationships of heavy metals and metalloids, followed by a detailed coverage of 21 individual elements, including: antimony, arsenic, barium, cadmium, chromium, cobalt, copper, gold, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, tin, tungsten, uranium, vanadium and zinc.

The book is highly relevant for those involved in environmental science, soil science, geochemistry, agronomy, environmental health, and environmental engineering, including specialists responsible for the management and clean-up of contaminated land.

Environmental Monitoring and Characterization

The Encyclopedia of Food and Health provides users with a solid bridge of current and accurate information spanning food production and processing, from distribution and consumption to health effects. The Encyclopedia comprises five volumes, each containing comprehensive, thorough coverage, and a writing style that is succinct and straightforward. Users will find this to be a meticulously organized resource of the best available summary and conclusions on each topic. Written from a truly international perspective, and covering of all areas of food science and health in over 550 articles, with extensive cross-referencing and further reading at the end of each chapter, this updated encyclopedia is an invaluable resource for both research and educational needs. Identifies the essential nutrients and how to avoid their deficiencies Explores the use of diet to reduce disease risk and optimize health Compiles methods for detection and quantitation of food constituents, food additives and nutrients, and contaminants Contains coverage of all areas of food science and health in nearly 700 articles, with extensive cross-referencing and further reading at the end of each chapter

Bioremediation and Biotechnology

Ecosystem science has developed into a major part of contemporary ecology, and it is now applied to diagnose and solve a wide range of important environmental problems. Fundamentals of Ecosystem Science provides a compact and comprehensive introduction to modern ecosystem science. Written by a group of experts, this book covers major concepts of ecosystem science, biogeochemistry, and energetics. Addresses, contrasts, and compares both terrestrial and aquatic ecosystems Combines general lessons, concepts, frameworks, and challenges in highly accessible synthesis chapters Presents firsthand case studies, written by leaders in the field, offering personal insights into how adopting an ecosystem approach led to innovations, new understanding, management changes, and policy solutions

Environmental Microbiology

Managing Ocean Environments in a Changing Climate summarizes the current state of several threats to the global oceans. What distinguishes this book most from previous works is that this book begins with a holistic, global-scale focus for the first several chapters and then provides an example of how this approach can be applied on a regional scale, for the Pacific region. Previous works usually have compiled local studies, which are essentially impossible to properly integrate to the global scale. The editors have engaged leading scientists in a number of areas, such as fisheries and marine ecosystems, ocean

chemistry, marine biogeochemical cycling, oceans and climate change, and economics, to examine the threats to the oceans both individually and collectively, provide gross estimates of the economic and societal impacts of these threats, and deliver high-level recommendations. Nominated for a Katerva Award in 2012 in the Economy category State of the science reviews by known marine experts provide a concise, readable presentation written at a level for managers and students Links environmental and economic aspects of ocean threats and provides an economic analysis of action versus inaction Provides recommendations for stakeholders to help stimulate the development of policies that would help move toward sustainable use of marine resources and services

Environmental Microbiology of Aquatic and Waste Systems

This book will cover both the evidence for biofilms in many chronic bacterial infections as well as the problems facing these infections such as diagnostics and treatment regimes. A still increasing interest and emphasis on the sessile bacterial lifestyle biofilms has been seen since it was realized that that less than 0.1% of the total microbial biomass lives in the planktonic mode of growth. The term was coined in 1978 by Costerton et al. who defined the term biofilm for the first time.In 1993 the American Society for Microbiology (ASM) recognised that the biofilmmode of growth was relevant to microbiology. Lately many articles have been published on the clinical

implications of bacterial biofilms. Both original articles and reviews concerning the biofilm problem are available.

Biosolids Applied to Land

Toxic substances threatens aquatic and terrestrial ecosystems and ultimately human health. The book is a thoughtful effort in bringing forth the role of biotechnology for bioremediation and restoration of the ecosystems degraded by toxic and heavy metal pollution. The introductory chapters of the book deal with the understanding of the issues concerned with the pollution caused by toxic elements and heavy metals and their impacts on the different ecosystems followed by the techniques involved in monitoring of the pollution. These techniques include use of bio-indicators as well as modern techniques for the assessment and monitoring of toxicants in the environment. Detailed chapters discussing the role of microbial biota, aquatic plants, terrestrial plants to enhance the accumulation efficiency of these toxic and heavy metals are followed by remediation techniques involving myco-remediation, bio-pesticides, bio-fertilizers, phyto-remediation and rhizo-filtration. A sizable portion of the book has been dedicated to the advanced bio-remediation techniques which are finding their way from the laboratory to the field for revival of the degraded ecosystems. These involve bio-films, micro-algae, genetically modified plants and filter feeders. Furthermore, the book is a detailed comprehensive account for the treatment technologies from

unsustainable to sustainable. We believe academicians, researchers and students will find this book informative as a complete reference for biotechnological intervention for sustainable treatment of pollution.

Biofilm Infections

Environmental and Pollution Science, Third Edition, continues its tradition on providing readers with the scientific basis to understand, manage, mitigate, and prevent pollution across the environment, be it air, land, or water. Pollution originates from a wide variety of sources, both natural and man-made, and occurs in a wide variety of forms including, biological, chemical, particulate or even energy, making a multivariate approach to assessment and mitigation essential for success. This third edition has been updated and revised to include topics that are critical to addressing pollution issues, from human-health impacts to environmental justice to developing sustainable solutions. Environmental and Pollution Science, Third Edition is designed to give readers the tools to be able to understand and implement multi-disciplinary approaches to help solve current and future environmental pollution problems. Emphasizes conceptual understanding of environmental systems and can be used by students and professionals from a diversity of backgrounds focusing on the environment Covers many aspects critical to assessing and managing environmental pollution including characterization, risk assessment, regulation, transport and fate, and remediation or restoration

New topics to this edition include Ecosystems and Ecosystem Services, Pollution in the Global System, Human Health Impacts, the interrelation between Soil and Human Health, Environmental Justice and Community Engagement, and Sustainability and Sustainable Solutions Includes color photos and diagrams, chapter questions and problems, and highlighted key words

Green Bio-processes

Fungi research and knowledge grew rapidly following recent advances in genetics and genomics. This book synthesizes new knowledge with existing information to stimulate new scientific questions and propel fungal scientists on to the next stages of research. This book is a comprehensive guide on fungi, environmental sensing, genetics, genomics, interactions with microbes, plants, insects, and humans, technological applications, and natural product development.

Environmental Microbiology

E-Books in Academic Libraries: Stepping Up to the Challenge provides readers with a view of the changing and emerging roles of electronic books in higher education. The three main sections contain contributions by experts in the publisher/vendor arena, as well as by librarians who report on both the challenges of offering and managing e-books and on the issues surrounding patron use of e-books. The case study section offers perspectives from seven

different sizes and types of libraries whose librarians describe innovative and thought-provoking projects involving e-books.Read about perspectives on e-books from organizations as diverse as a commercial publisher and an association press. Learn about the viewpoint of a jobber. Find out about the e-book challenges facing librarians, such as the quest to control costs in the patron-driven acquisitions (PDA) model, how to solve the dilemma of resource sharing with e-books, and how to manage PDA in the consortial environment. See what patron use of e-books reveals about reading habits and disciplinary differences.Finally, in the case study section, discover how to promote scholarly e-books, how to manage an e-reader checkout program, and how one library replaced most of its print collection with e-books. These and other examples illustrate how innovative librarians use e-books to enhance users' experiences with scholarly works.

Managing Ocean Environments in a Changing Climate

Starting in the early 1970s, a type of programmed cell death called apoptosis began to receive attention. Over the next three decades, research in this area continued at an accelerated rate. In the early 1990s, a second type of programmed cell death, autophagy, came into focus. Autophagy has been studied in mammalian cells for many years. The recen

Academic E-Books

This beautifully illustrated text is designed to serve the integrated, rigorous science-based undergraduate curriculum that is emerging in environmental science. Emphasis is placed on a conceptual understanding of environmental impact by integrating the key scientific disciplines that investigate the sources, fate, transport, mitigation, and toxicology of pollutants. Abiotic and biotic processes in the soil/vadose zone, surface waters, and the atmosphere are all examined in the context of existing pollution and the potential to minimize future pollution. Innovative coverage includes the practical problems of remediation, environmental monitoring and risk assessment and management. The book will also serve as an authoritative reference for advanced students and environmental professionals. Key Features * Integrates areas of biology, chemistry, physics, mathematics, and earth sciences related to the fate, mitigation, and transport of pollutants * Evaluates pollution in the soil/vadose zone, the atmosphere, surface water, and groundwater * Written by nationally recognized experts * Richly illustrated and documented with 186 full color illustrations and photographs and 79 tables * Concepts are clearly presented yet maintain rigor

Pollution Science

The Perfect Slime presents the latest state of knowledge and all aspects of the Extracellular Polymeric Substances, (EPS) matrix – from the ecological and health to the antifouling perspectives. The book brings together all the current material in

order to expand our understanding of the functions, properties and characteristics of the matrix as well as the possibilities to strengthen or weaken it. The EPS matrix represents the immediate environment in which biofilm organisms live. From their point of view, this matrix has paramount advantages. It allows them to stay together for extended periods and form synergistic microconsortia, it retains extracellular enzymes and turns the matrix into an external digestion system and it is a universal recycling yard, it protects them against desiccation, it allows for intense communication and represents a huge genetic archive. They can remodel their matrix, break free and eventually, they can use it as a nutrient source. The EPS matrix can be considered as one of the emergent properties of biofilms and are a major reason for the success of this form of life. Nevertheless, they have been termed the “black matter of biofilms” for good reasons. First of all: the isolation methods define the results. In most cases, only water soluble EPS components are investigated; insoluble ones such as cellulose or amyloids are much less included. In particular in environmental biofilms with many species, it is difficult to impossible isolate, separate the various EPS molecules they are encased in and to define which species produced which EPS. The regulation and the factors which trigger or inhibit EPS production are still very poorly understood. Furthermore: bacteria are not the only microorganisms to produce EPS. Archaea, Fungi and algae can also form EPS. This book investigates the questions, What is their composition, function, dynamics and regulation? What do they all have in common?

Environmental and Pollution Science

Environmental and Pollution Science, Third Edition, continues its tradition on providing readers with the scientific basis to understand, manage, mitigate, and prevent pollution across the environment, be it air, land, or water. Pollution originates from a wide variety of sources, both natural and man-made, and occurs in a wide variety of forms including, biological, chemical, particulate or even energy, making a multivariate approach to assessment and mitigation essential for success. This third edition has been updated and revised to include topics that are critical to addressing pollution issues, from human-health impacts to environmental justice to developing sustainable solutions. Environmental and Pollution Science, Third Edition is designed to give readers the tools to be able to understand and implement multi-disciplinary approaches to help solve current and future environmental pollution problems. Emphasizes conceptual understanding of environmental systems and can be used by students and professionals from a diversity of backgrounds focusing on the environment Covers many aspects critical to assessing and managing environmental pollution including characterization, risk assessment, regulation, transport and fate, and remediation or restoration New topics to this edition include Ecosystems and Ecosystem Services, Pollution in the Global System, Human Health Impacts, the interrelation between Soil and Human Health, Environmental Justice and Community Engagement, and Sustainability and Sustainable Solutions Includes color photos and

diagrams, chapter questions and problems, and highlighted key words

The Fungal Kingdom

This book focuses on successful application of microbial biotechnology in areas such as medicine, agriculture, environment and human health.

Microorganisms for Green Revolution

With the help of leading Quality Assurance (QA) and Quality Control (QC) microbiology specialists in Europe, a complete set of guidelines on how to start and implement a quality system in a microbiological laboratory has been prepared, supported by the European Commission through the Measurement and Testing Programme. The working group included food and water microbiologists from various testing laboratories, universities and industry, as well as statisticians and QA and QC specialists in chemistry. This book contains the outcome of their work. It has been written with the express objective of using simple but accurate wording so as to be accessible to all microbiology laboratory staff. To facilitate reading, the more specialized items, in particular some statistical treatments, have been added as an annex to the book. All QA and QC tools mentioned within these guidelines have been developed and applied by the authors in their own laboratories. All aspects dealing with reference materials and interlaboratory studies have been taken in a large part from the projects conducted within the BCR and Measurement

and Testing Programmes of the European Commission. With so many different quality control procedures, their introduction in a laboratory would appear to be a formidable task. The authors recognize that each laboratory manager will choose the most appropriate procedures, depending on the type and size of the laboratory in question. Accreditation bodies will not expect the introduction of all measures, only those that are appropriate for a particular laboratory. Features of this book: • Gives all quality assurance and control measures to be taken, from sampling to expression of results • Provides practical aspects of quality control to be applied both for the analyst and top management • Describes the use of reference materials for statistical control of methods and use of certified reference materials (including statistical tools).

The Perfect Slime

Rather than a loosely connected list of facts/topics, this book addresses virtually every field that involves the use of developing animals in environmental science. In doing so, it will help define the scientific collective within these fields to both those readers who are "outside" of a particular field (students and professionals alike) and those who work within said field, where multiple iterations of the same job description exist. Both the content and choice of authors fully support this goal, as the editors and contributing authors represent contemporary thought and experimentation in their respective fields – ranging from developmental physiology through

environmental toxicology to medicine. As such, this work will appeal to a broad audience, including any scientist or trainee interested in the nexus of environment, development and physiology.

Molecular Biology and Genetic Engineering

The third edition of Ecology and Classification of North American Freshwater Invertebrates continues the tradition of in-depth coverage of the biology, ecology, phylogeny, and identification of freshwater invertebrates from the USA and Canada. This text serves as an authoritative single source for a broad coverage of the anatomy, physiology, ecology, and phylogeny of all major groups of invertebrates in inland waters of North America, north of Mexico.

Microbiological Analysis of Food and Water

Designed for advanced undergraduate students, graduate students, and environmental professionals, this book builds upon the tremendous success of the previous editions with a comprehensive and up-to-date discussion of environmental microbiology as a discipline that has greatly expanded in scope and interest over the past several decades. From terrestrial and aquatic ecosystems to urban and indoor environments, this edition relates environmental microbiology to a variety of life science, ecology, and environmental science topics including biogeochemical cycling, bioremediation,

environmental transmission of pathogens, microbial risk assessment, and drinking water treatment and reuse. The final chapter highlights several emerging issues including microbial remediation of marine oil spills, microbial contributions to global warming, impact of climate change on microbial infectious disease, and the development of antibiotic-resistant bacteria. Presents state-of-the-art research results with key, recent references to document information Emphasizes critical information using "Information Boxes" throughout Includes real-world case studies to illustrate concepts, along with frequent use of graphics, cartoons and photographs Offers questions at the end of each chapter designed to test key concepts Lecture slides available for instructors online

Sustainable Development of Algal Biofuels in the United States

PART I Molecular Biology 1. Molecular Biology and Genetic Engineering Definition, History and Scope 2. Chemistry of the Cell: 1. Micromolecules (Sugars, Fatty Acids, Amino Acids, Nucleotides and Lipids) Sugars (Carbohydrates) 3. Chemistry of the Cell . 2. Macromolecules (Nucleic Acids; Proteins and Polysaccharides) Covalent and Weak Non-covalent Bonds 4. Chemistry of the Gene: Synthesis, Modification and Repair of DNA DNA Replication: General Features 5. Organisation of Genetic Material 1. Packaging of DNA as Nucleosomes in Eukaryotes Techniques Leading to Nucleosome Discovery 6. Organization of Genetic Material 2. Repetitive and Unique DNA Sequences 7. Organization of Genetic

Material: 3. Split Genes, Overlapping Genes, Pseudogenes and Cryptic Genes Split Genes or .Interrupted Genes 8. Multigene Families in Eukaryotes 9. Organization of Mitochondrial and Chloroplast Genomes 10. The Genetic Code 11. Protein Synthesis Apparatus Ribosome, Transfer RNA and Aminoacyl-tRNA Synthetases Ribosome 12. Expression of Gene . Protein Synthesis 1. Transcription in Prokaryotes and Eukaryotes 13. Expression of Gene: Protein Synthesis: 2. RNA Processing (RNA Splicing, RNA Editing and Ribozymes) Polyadenylation of mRNA in Prokaryotes Addition of Cap (m7G) and Tail (Poly A) for mRNA in Eukaryotes 14. Expression of Gene: Protein Synthesis: 3. Synthesis and Transport of Proteins (Prokaryotes and Eukaryotes) Formation of Aminoacyl tRNA 15. Regulation of Gene Expression: 1. Operon Circuits in Bacteria and Other Prokaryotes 16. Regulation of Gene Expression . 2. Circuits for Lytic Cycle and Lysogeny in Bacteriophages 17. Regulation of Gene Expression 3. A Variety of Mechanisms in Eukaryotes (Including Cell Receptors and Cell Signalling) PART II Genetic Engineering 18. Recombinant DNA and Gene Cloning 1. Cloning and Expression Vectors 19. Recombinant DNA and Gene Cloning 2. Chimeric DNA, Molecular Probes and Gene Libraries 20. Polymerase Chain Reaction (PCR) and Gene Amplification 21. Isolation, Sequencing and Synthesis of Genes 22. Proteins: Separation, Purification and Identification 23. Immunotechnology 1. B-Cells, Antibodies, Interferons and Vaccines 24. Immunotechnology 2. T-Cell Receptors and MHC Restriction 25. Immunotechnology 3. Hybridoma and Monoclonal Antibodies (mAbs) Hybridoma Technology and the

Production of Monoclonal Antibodies 26. Transfection Methods and Transgenic Animals 27. Animal and Human Genomics: Molecular Maps and Genome Sequences Molecular Markers 28. Biotechnology in Medicine: l.Vaccines, Diagnostics and Forensics Animal and Human Health Care 29. Biotechnology in Medicine 2. Gene Therapy Human Diseases Targeted for Gene Therapy Vectors and Other Delivery Systems for Gene Therapy 30. Biotechnology in Medicine: 3. Pharmacogenetics / Pharmacogenomics and Personalized Medicine Phannacogenetics and Personalized 31. Plant Cell and Tissue Culture' Production and Uses of Haploids 32. Gene Transfer Methods in Plants 33. Transgenic Plants . Genetically Modified (GM) Crops and Floricultural Plants 34. Plant Genomics: 35. Genetically Engineered Microbes (GEMs) and Microbial Genomics References