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Plant Metabolomics - Kazuki Saito 2006-06-29
Metabolomics – which deals with all metabolites of an organism – is a rapidly-emerging sector of post-genome research fields. It plays significant roles in a variety of fields from medicine to agriculture and holds a fundamental position in functional genomics studies and their application in plant biotechnology. This volume comprehensively covers plant metabolomics for the first time. The chapters offer cutting-edge information on analytical technology, bioinformatics and applications. They were all written by leading researchers who have been directly involved in plant metabolomics research throughout the world. Up-to-date information and future developments are described, thereby producing a volume which is a landmark of plant metabolomics research and a beneficial guideline to graduate students and researchers in academia, industry, and technology transfer organizations in all plant science fields.
Microbes at Work - Heribert Insam 2009-12-07
Among the goals of environmentally sound waste treatment is the recycling of organic wastes. The most practiced options are composting and anaerobic digestion, both processes being carried out by microorganisms. This book provides an overview of the various ways microbes are doing their job and gives the reader an impression of their potential. The sixteen chapters of this book summarize the advantages and disadvantages of treatment processes, whether they are aerobic like composting or work without oxygen like anaerobic digestion for biogas (methane) production. These chapters show the potential of microorganisms to create valuable resources from otherwise wasted materials. These resources include profitable organic, humus-like soil conditioners or fertilizer components which are often suppressive to plant diseases. Composts may thus improve soil carbon sequestration, or support sustainable agriculture by reducing the need for mineral fertilizers or pesticides. If anaerobic digestion is used, the biogas produced may replace fossil fuels. Thus, proper biological waste treatment with the help of microorganisms should contribute to a reduction of anthropogenic greenhouse gas production.
Bioinorganic Vanadium Chemistry - Dieter Rehder 2008-04-15
Vanadium is named after Vanadis, the most aristocratic of Norse goddesses, who symbolises beauty and fertility - essential features of vanadium chemistry. It is a

ubiquitous trace element, with a surprising range of biological functions. In Bioinorganic Vanadium Chemistry, Dieter Rehder addresses the major aspects of vanadium chemistry related to living organisms and the mutual impact between biological and inorganic vanadium chemistry. Topics covered include: the history, natural occurrence, distribution and impact of vanadium inorganic aspects of the function of vanadium in biological systems interaction of aqueous vanadate and vanadyl with biogenic ligands vanadium coordination compounds the vanadium-carbon bond methods of characterisation of biogenic and model vanadium systems (EPR and ENDOR for oxovanadium(IV); 51V NMR for vanadium(V); XAS) vanadium in ascidians and polychaeta worms the concentration of vanadium in the form of amavadin by Amanita mushrooms vanadate-dependent haloperoxidases vanadium and the nitrogen cycle vanadate as energiser for bacteria, and vanadophores medicinal aspectsm including the anti-diabetic potential of vanadium compounds interaction of vanadium with proteins and protein substrates vanadium and phosphate-metabolising enzymes Bioinorganic Vanadium Chemistry conveys the essential aspects of vanadium bioinorganic chemistry, making this book a valuable complement to more general bioinorganic chemistry texts and more specialized topical reviews for researchers and students alike.

Guidelines for the Safe Use of Wastewater, Excreta and Greywater - World Health Organization 2006

Volume 4 of the Guidelines for the safe use of wastewater, excreta and greywater provides information on the assessment and management of risks associated with microbial hazards. It explains requirements to promote the safe use of excreta and greywater in agriculture, including minimum procedures and specific health-based targets, and how those requirements are intended to be used. This volume also describes the approaches used in deriving the guidelines, including health-based targets, and includes a substantive revision of approaches to ensuring microbial safety

Modelling Nutrient Digestion and Utilisation in Farm Animals - D. Sauvant 2011-05-02

For more than 30 years, modelling has been an important method for integrating, in a flexible, comprehensive and widely applicable way, basic knowledge and biological concepts on digestion and metabolism in farm animals. The purpose of this book is to present the 'state of art' in this area. The chapters are written by leading teams and researchers in this field of study, mainly from Europe, North America and Australasia. Considerable progress has been made in topics dealing with: modelling methods, feeding behaviour, digestion and metabolic processes in ruminants and monogastric animals. This progress is clearly illustrated by the emergence of a new paradigm in animal nutrition, which has moved from the aim to cover the requirements of the animal to explaining and predicting the responses of the animals to diets (e.g., productivity and efficiency, impact on quality of products, environmental aspects, health and well-being). In this book several chapters illustrate that through empirical models, meta-analysis is an efficient tool to synthesize information gathered over recent decades. In addition, compared with other books on modelling farm animal nutrition, two new aspects received particular attention: expanding knowledge of the individual animal to understanding the functioning and management of herds, and the consideration of the environmental impact of animal production. This book is a valuable source of information for researchers, nutritionists, advisors, and graduate students who want to have up-to-date and concise information on mathematical modelling applied to farm animals.

Escherichia Coli and Salmonella - Frederick Carl Neidhardt 1996

Advances in Biotechnology for Food Industry - Alexandru Mihai Grumezescu 2018-02-03

Advances in Biotechnology for Food Industry, Volume Fourteen in the Handbook of Food Bioengineering series, provides recent insight into how biotechnology impacts the global food industry and describes how food needs are diverse, requiring the development of innovative biotechnological processes to ensure efficient food production worldwide. Many approaches were developed over the last 10 years to allow faster, easier production of widely used foods, food components and therapeutic food ingredients. This volume shows how biotechnological processes increase production and quality of food products, including the development of anti-biofilm materials to decrease microbial colonization in bioreactors and food processing facilities. Presents basic to advanced technological applications in food biotechnology Includes various scientific techniques used to produce specific desired traits in plants, animals and microorganisms Provides scientific advances in food processing and their impact on the environment, human health and food safety Discusses the development of controlled co-cultivations for reproducible results in fermentation processes in food biotechnology

Evolution of Ionizing Radiation Research - Mitsuru Nenoi 2015-09-17

The industrial and medical applications of radiation have been augmented and scientific insight into mechanisms for radiation action notably progressed. In addition, the public concern about radiation risk has also grown extensively. Today the importance of risk communication among stakeholders involved in radiation-related issues is emphasized much more than any time in the past. Thus, the circumstances of radiation research have drastically changed, and the demand for a novel approach to radiation-related issues is increasing. It is thought that the publication of the book Evolution of Ionizing Radiation Research at this time would have enormous impacts on the society. The editor believes that technical experts would find a variety of new ideas and hints in this book that would be helpful to them to tackle ionizing radiation.

Methods in Microbiology - 1985-06-21

Established almost 30 years ago, Methods in Microbiology is the most prestigious series devoted to techniques and methodology in the field. Now totally revamped, revitalized, with a new format and expanded scope, Methods in Microbiology will continue to provide you with tried and tested, cutting-edge protocols to directly benefit your research.

Genomics of Bacterial Metal Resistance - Alessio Mengoni 2021-03-03

The importance of understanding metal–microbe interactions underlies a number of social–economic issues in the world. The antimicrobial resistance era has created a need for novel antimicrobials and within this fieldm metal and metalloid ions are promising solutions. Pollution sites, either co-contaminated with metals or with metals as the sole pollutant, contain microbes that are present as key participants, with both of these issues habing links to agriculture. Microbes also play key roles in the global geochemical cycle of many elements. Such statements solidify the need to understand metal–microbe interactions. Given that genomics has arguably become the most useful tool in biology, the application of this technology within the field of understanding metal resistance comes as no surprise. Whilst by no means comprehensive, this book provides examples of the applications of genomic approaches in the study of metal–microbe interactions. Here, we present a collection of manuscripts that highlights some present directions in the field. The book starts with a collection of three papers evaluating aspects of the genomics of the archetype metal resistant bacteria, Cuprividus metallidurans. This is followed by four studies that evaluate the mechanisms of metal resistance. The next two papers assess metal resistance in agricultural related situations, including a review on metal resistance in Listeria. The book concludes with a review on metal phytoremediation via Rhizobia and two

subsequent studies of metal biotechnology relevance.

Methods for General and Molecular Microbiology - C. A. Reddy 2007-08-17

A first source for traditional methods of microbiology as well as commonly used modern molecular microbiological methods. • Provides a comprehensive compendium of methods used in general and molecular microbiology. • Contains many new and expanded chapters, including a section on the newly important field of community and genomic analysis. • Provides step-by-step coverage of procedures, with an extensive list of references to guide the user to the original literature for more complete descriptions. • Presents methods for bacteria, archaea, and for the first time a section on mycology. • Numerous schematics and illustrations (both color and black and white) help the reader to easily understand the topics presented.

Essentials of Single-Cell Analysis - Fan-Gang Tseng 2016-01-21

This book provides an overview of single-cell isolation, separation, injection, lysis and dynamics analysis as well as a study of their heterogeneity using different miniaturized devices. As an important part of single-cell analysis, different techniques including electroporation, microinjection, optical trapping, optoporation, rapid electrokinetic patterning and optoelectronic tweezers are described in detail. It presents different fluidic systems (e.g. continuous micro/nano-fluidic devices, microfluidic cytometry) and their integration with sensor technology, optical and hydrodynamic stretchers etc., and demonstrates the applications of single-cell analysis in systems biology, proteomics, genomics, epigenomics, cancer transcriptomics, metabolomics, biomedicine and drug delivery systems. It also discusses the future challenges for single-cell analysis, including the advantages and limitations. This book is enjoyable reading material while at the same time providing essential information to scientists in academia and professionals in industry working on different aspects of single-cell analysis. Dr. Fan-Gang Tseng is a Distinguished Professor of Engineering and System Science at the National Tsing Hua University, Taiwan. Dr. Tuhin Subhra Santra is a Research Associate at the California Nano Systems Institute, University of California at Los Angeles, USA.

Environmental Microbiology - John F. T. Spencer 2008-02-05

The methods included in Environmental Microbiology: Methods and Pro- cols can be placed in the categories “Communities and Biofilms,” “Fermented Milks,” “Recovery and Determination of Nucleic Acids,” and the review s- tion, containing chapters on the endophytic bacterium, Bacillus mojavensis, the engineering of bacteria to enhance their ability to carry out bioremediation of aromatic compounds, using the hemoglobin gene from a strain of Vitreoscilla 23 spp., and the use of chemical shift reagents and Na NMR to study sodium gradients in microorganisms, all of which should be of interest to investigators in these fields. The subjects treated within the different categories also cover a wide range, with methods ranging from those for the study of marine organisms, through those for the investigation of microorganisms occurring in ground waters, including subsurface ground waters, to other types of environmental waters, to as varied subjects as the biodiversity of yeasts found in northwest Argentina. The range of topics described in the Fermented Milks section is smaller, but significant for investigators in areas concerned with milk as an item of foods for infants, small children, and even adults.

Biology and Biotechnology of Actinobacteria - Joachim Wink 2017-10-19

This book provides in-depth insights into the biology, taxonomy, genetics, physiology and biotechnological applications of Actinobacteria. It especially focuses on the latter, reviewing the wide variety of actinobacterial bioactive molecules and their benefits for diverse industrial applications such as agriculture, aquaculture, biofuel production and food technology. Actinobacteria are one of the most promising sources of small bioactive molecules and it is estimated that only a small percentage of actinobacterial

bioactive chemicals have been discovered to date. Identifying new diverse gene clusters of biotechnological relevance in the genome of Actinobacteria will be crucial to developing advanced applications for pharmaceutical, industrial and agricultural purposes. The book offers a unique resource for all graduate students, researchers and practitioners in the fields of microbiology, microbial biotechnology, and the genetic engineering of Actinobacteria.

Thermodynamics of Biochemical Reactions - Robert A. Alberty 2005-01-28

Thermodynamics of Biochemical Reactions emphasizes the fundamental equations of thermodynamics and the application of these equations to systems of biochemical reactions. This emphasis leads to new thermodynamic potentials that provide criteria for spontaneous change and equilibrium under the conditions in a living cell.

Extracellular Matrix Degradation - William C. Parks 2011-04-07

Regulated turnover of extracellular matrix (ECM) is an important component of tissue homeostasis. In recent years, the enzymes that participate in, and control ECM turnover have been the focus of research that touches on development, tissue remodeling, inflammation and disease. This volume in the Biology of Extracellular Matrix series provides a review of the known classes of proteases that degrade ECM both outside and inside the cell. The specific EMC proteases that are discussed include cathepsins, bacterial collagenases, matrix metalloproteinases, meprins, serine proteases, and elastases. The volume also discusses the domains responsible for specific biochemical characteristics of the proteases and the physical interactions that occur when the protease interacts with substrate. The topics covered in this volume provide an important context for understanding the role that matrix-degrading proteases play in normal tissue remodeling and in diseases such as cancer and lung disease.

Soil and Recycling Management in the Anthropocene Era - Gero Benckiser 2022-03-17

This book discusses soil and recycling management in the Anthropocene era. Nitrogen shortage is one of nature’s most important productivity regulators, but since the advent of technical nitrogen fixation (TNF), biological nitrogen fixation (BNF) input has nearly doubled, particularly in grass and arable lands covering over 13 million km2 of the Earth’s surface. This book explores how monoculture grass, arable lands and forests are often over fertilized with TNF, animal slurries, sewage sludge, or municipally produced composts, and as a result, flora and fauna that have adapted to a nitrogen shortage in the soil will have to adjust to a surplus; those that are unable to adapt will disappear.

Statistical Methods in e-Commerce Research - Wolfgang Jank 2008-12-29

This groundbreaking book introduces the application of statistical methodologies to e-Commerce data With the expanding presence of technology in today's economic market, the use of the Internet for buying, selling, and investing is growing more popular and public in nature. Statistical Methods in e-Commerce Research is the first book of its kind to focus on the statistical models and methods that are essential in order to analyze information from electronic-commerce (e-Commerce) transactions, identify the challenges that arise with new e-Commerce data structures, and discover new knowledge about consumer activity. This collection gathers over thirty researchers and practitioners from the fields of statistics, computer science, information systems, and marketing to discuss the growing use of statistical methods in e-Commerce research. From privacy protection to economic impact, the book first identifies the many obstacles that are encountered while collecting, cleaning, exploring, and analyzing e-Commerce data. Solutions to these problems are then suggested using established and newly developed statistical and data mining methods. Finally, a look into the future of this evolving area of study is provided through an in-depth discussion

of the emerging methods for conducting e-Commerce research. Statistical Methods in e-Commerce Research successfully bridges the gap between statistics and e-Commerce, introducing a statistical approach to solving challenges that arise in the context of online transactions, while also introducing a wide range of e-Commerce applications and problems where novel statistical methodology is warranted. It is an ideal text for courses on e-Commerce at the upper-undergraduate and graduate levels and also serves as a valuable reference for researchers and analysts across a wide array of subject areas, including economics, marketing, and information systems who would like to gain a deeper understanding of the use of statistics in their work.

Lattice - Deepayan Sarkar 2008-02-15

Written by the author of the lattice system, this book describes lattice in considerable depth, beginning with the essentials and systematically delving into specific low levels details as necessary. No prior experience with lattice is required to read the book, although basic familiarity with R is assumed. The book contains close to 150 figures produced with lattice. Many of the examples emphasize principles of good graphical design; almost all use real data sets that are publicly available in various R packages. All code and figures in the book are also available online, along with supplementary material covering more advanced topics.

Medical Mycology in the United States - Ana Victoria Espinell-Ingroff 2013-03-09

The development of medical mycology in the United States is assessed within the context of scientific progress as demonstrated by the creativity and scholarly contributions from research, technological activities, and training toward the management of fungal diseases. Although it focuses on American figures and events, it covers the origins of the discipline in Europe and Latin America. It describes historically significant scientific, technological and educational development and the narrative description is accompanied by an analysis of the causes of these and their perceived impact on the development of the discipline from the late 1880s into the 1990s. The development was conceptualised into five aras: the era of discovery, the formative years, the advent of antifungal and immunosuppressive therapies, the years of expansion and the era of transition.

Soil and Recycling Management in the Anthropocene Era - Gero Benckiser 2021-03-15

This book discusses soil and recycling management in the Anthropocene era. Nitrogen shortage is one of nature’s most important productivity regulators, but since the advent of technical nitrogen fixation (TNF), biological nitrogen fixation (BNF) input has nearly doubled, particularly in grass and arable lands covering over 13 million km2 of the Earth’s surface. This book explores how monoculture grass, arable lands and forests are often over fertilized with TNF, animal slurries, sewage sludge, or municipally produced composts, and as a result, flora and fauna that have adapted to a nitrogen shortage in the soil will have to adjust to a surplus; those that are unable to adapt will disappear.

Media for Isolation-cultivation-identification-maintenance of Medical Bacteria - Jean F. Mac Faddin 1985

Microbial Taxonomy, Phylogeny and Biodiversity - Jesús L. Romalde 2019-12-31

The great diversity of microbial life is the remaining major reservoir of unknown biological diversity on earth. To understand this vast, but largely unperceived diversity with its untapped genetic, enzymatic and industrial potential, microbial systematics is undergoing a revolutionary change in its approach to describe novel taxa based on genomic/envirogenomic information. The characterization of an organism is no longer bounded by methodological barriers, and it is now possible to fully sequence the whole genome of a strain to study individual genes, or to examine the genetic information by using different techniques. In fact, application of genomics is helping not only to provide a better understanding of

the boundaries of genera and higher levels of classification, but also to refine our definition of the species concept. In addition, increased understanding of phylogeny is allowing to predict the genetic potential of microorganisms for biotechnological applications and adaptation to environmental changes. The present Research Topic on “Microbial Taxonomy, Phylogeny and Biodiversity” compiles a collection of papers covering the use of genomic sequence data in microbial taxonomy and systematics, including evolutionary relatedness of microorganisms; application of comparative genomics in systematic studies; or metagenomic approaches for biodiversity studies. We hope that this eBook incentives and encourages researchers for future discussions on microbial taxonomy and phylogenetics.

Research in Computational Molecular Biology - Minghua Deng 2013-03-22

This book constitutes the refereed proceedings of the 17th Annual International Conference on Research in Computational Molecular Biology, RECOMB 2013, held in Beijing, China, in April 2013. The 32 revised full papers were carefully reviewed and selected from 167 submissions. The papers cover a wide range of topics including molecular sequence analysis; genes and regulatory elements; molecular evolution; gene expression; biological networks; sequencing and genotyping technologies; genomics; epigenomics; metagenomics; population, statistical genetics; systems biology; computational proteomics; computational structural biology; imaging; large-scale data management.

Current Challenges in Modeling Cellular Metabolism - Daniel Machado 2016-01-21

Mathematical and computational models play an essential role in understanding the cellular metabolism. They are used as platforms to integrate current knowledge on a biological system and to systematically test and predict the effect of manipulations to such systems. The recent advances in genome sequencing techniques have facilitated the reconstruction of genome-scale metabolic networks for a wide variety of organisms from microbes to human cells. These models have been successfully used in multiple biotechnological applications. Despite these advancements, modeling cellular metabolism still presents many challenges. The aim of this Research Topic is not only to expose and consolidate the state-of-the-art in metabolic modeling approaches, but also to push this frontier beyond the current edge through the introduction of innovative solutions. The articles presented in this e-book address some of the main challenges in the field, including the integration of different modeling formalisms, the integration of heterogeneous data sources into metabolic models, explicit representation of other biological processes during phenotype simulation, and standardization efforts in the representation of metabolic models and simulation results.

Antimicrobial Resistance and Virulence Common Mechanisms - Etienne Giraud 2017-06-01

Multiple relationships exist between antimicrobial resistance and bacterial virulence, and the spread of clones combining multiple antibiotic resistance and a high virulence level is an increasing problem. It was previously described how mutation-driven or horizontally acquired resistance mechanisms can also have effects on virulence. It was also reported that mobile genetic elements often carry both resistance determinants and virulence-modulating genes, which favors the co-selection of both traits. In the present volume, we present a collection of articles which document additional aspects of the interactions between antimicrobial resistance and virulence in bacteria, and describe their potential therapeutic consequences.

Foundations and Applications of Statistics - Randall J. Pruim 2011

Foundations and Applications of Statistics simultaneously emphasizes both the foundational and the computational aspects of modern statistics. Engaging and accessible, this book is useful to

undergraduate students with a wide range of backgrounds and career goals. The exposition immediately begins with statistics, presenting concepts and results from probability along the way. Hypothesis testing is introduced very early, and the motivation for several probability distributions comes from p-value computations. Pruim develops the students' practical statistical reasoning through explicit examples and through numerical and graphical summaries of data that allow intuitive inferences before introducing the formal machinery. The topics have been selected to reflect the current practice in statistics, where computation is an indispensible tool. In this vein, the statistical computing environment \mathsf{R} is used throughout the text and is integral to the exposition. Attention is paid to developing students' mathematical and computational skills as well as their statistical reasoning. Linear models, such as regression and ANOVA, are treated with explicit reference to the underlying linear algebra, which is motivated geometrically. Foundations and Applications of Statistics discusses both the mathematical theory underlying statistics and practical applications that make it a powerful tool across disciplines. The book contains ample material for a two-semester course in undergraduate probability and statistics. A one-semester course based on the book will cover hypothesis testing and confidence intervals for the most common situations.

Salmonella enterica Serovar Enteritidis in Humans and Animals - 1999-06-09

In recent decades Salmonella has become a scourge of pandemic proportions, most commonly in the form of Salmonella Enteritidis, the serotype discussed in this book. This timely account of Salmonella Enteritidis as a public threat and a medical problem represents the various efforts of health professionals around the world to understand and control this widespread disease. Adopting a perspective that ranges from the global to the molecular, the authors describe first-hand the epidemiology, prevention, and control of Salmonella Enteritidis in countries including Great Britain, France, Germany, Denmark, Switzerland, The Netherlands, Italy, Austria, and the United States, with a tightly focused account of an outbreak in New York City from 1993 to 1995. Unique in its detailed overview of this prevalent disease, this book will be of great value to public health planners and medical and animal health agencies, as well as producers whose food products are susceptible to Salmonella and its devastating consequences on food safety.

Metabolism and Bacterial Pathogenesis - Tyrrell Conway 2020-07-24

Groundbreaking thinking on how bacterial metabolism is foundational to pathogenesis For too long, bacterial metabolism and bacterial pathogenesis have been studied as separate entities. However, the scientific community is beginning to realize that not only are bacterial nutrient acquisition and utilization essential for pathogenesis, but that interfering with the pathogen-specific metabolic pathways used during infection can regulate virulence factor expression and might lead to effective breakthroughs in a variety of treatments. Editors Paul Cohen and Tyrrell Conway, who pioneered the use of metabolic mutants in competitive colonization assays, an approach now widely used to investigate the nutrition of pathogens in vivo, are uniquely qualified to advance our knowledge of this integrative field of research. They convened a group of contributors who are breaking new ground in understanding how bacterial metabolism is foundational to pathogenesis to share their expert perspectives and outlook for the future. Beginning with overviews, Metabolism and Bacterial Pathogenesis covers a wide range of diseases and both Gram-positive and -negative bacteria that serve as model systems for in vitro and in vivo investigations intracellular, respiratory, and enteric pathogens pathogen-specific nutrient acquisition in hosts mechanisms of host-driven metabolic adaptation by pathogens metabolic regulation of virulence gene expression Useful for specialists in bacterial pathogenesis and specialists in

metabolism as well as molecular biologists, physicians, veterinarians, dentists, graduate and undergraduate students, and laboratory technicians, Metabolism and Bacterial Pathogenesis is also essential reading for scientists studying the microbiome.

Transforms and Applications Handbook - Alexander D. Poularikas 2018-09-03

Updating the original, Transforms and Applications Handbook, Third Edition solidifies its place as the complete resource on those mathematical transforms most frequently used by engineers, scientists, and mathematicians. Highlighting the use of transforms and their properties, this latest edition of the bestseller begins with a solid introduction to signals and systems, including properties of the delta function and some classical orthogonal functions. It then goes on to detail different transforms, including lapped, Mellin, wavelet, and Hartley varieties. Written by top experts, each chapter provides numerous examples and applications that clearly demonstrate the unique purpose and properties of each type. The material is presented in a way that makes it easy for readers from different backgrounds to familiarize themselves with the wide range of transform applications. Revisiting transforms previously covered, this book adds information on other important ones, including: Finite Hankel, Legendre, Jacobi, Gengenbauer, Laguerre, and Hermite Fraction Fourier Zak Continuous and discrete Chirp-Fourier Multidimensional discrete unitary Hilbert-Huang Most comparable books cover only a few of the transforms addressed here, making this text by far the most useful for anyone involved in signal processing—including electrical and communication engineers, mathematicians, and any other scientist working in this field.

Atlas of Oral Microbiology: From Healthy Microflora to Disease - Xuedong Zhou 2021-01-06

This book is the second edition of Atlas of Oral Microbiology: From Healthy Microflora to Disease (ISBN 978-0-12-802234-4), with two new features: we add about 60 pictures of 14 newly isolated microbes from human dental plaque, at the same time, we re-organize the content of this book and provide more research progress about the oral microbiome bank of China, the invasion of oral microbiota into the gut, and the relationships between Oral Microflora and Human Diseases. This book is keeping up with the advanced edge of the international research field of oral microbiology. It innovatively gives us a complete description of the oral microbial systems according to different oral ecosystems. It collects a large number of oral microbial pictures, including cultural pictures, colonies photos, and electron microscopy photos. It is by far the most abundant oral microbiology atlas consists of the largest number of pictures. In the meantime, it also described in detail a variety of experimental techniques, including microbiological isolation, culture, and identification. It is an atlas with strong practical function. The editors and writers of this book have long been engaged in teaching and research work in oral microbiology and oral microecology. This book deserves a broad audience, and it will meet the needs of researchers, clinicians, teachers, and students major in biology, dental medicine, basic medicine, or clinical medicine. It can also be used to facilitate teaching and international academic exchanges.

DNA Methylation Protocols - Ken I. Mills 2008-02-05

DNA Methylation Protocols offer a set of readily reproducible protocols of the analysis of DNA methylation and methylases. These powerful methods provide the tools necessary for studying methylation at both the global level and the level of sequence, and include many techniques for identifying genes that might be aberrantly methylated in cancer and aging. Additional methods cover genome-wide analysis of abnormal DNA methylation and the isolation and measurement of demethylases and related proteins.

Phage Therapy: Past, Present and Future - Stephen T. Abedon 2017-09-05

Historically, the first observation of a transmissible lytic agent that is specifically

active against a bacterium (Bacillus anthracis) was by a Russian microbiologist Nikolay Gamaleya in 1898. At that time, however, it was too early to make a connection to another discovery made by Dmitri Ivanovsky in 1892 and Martinus Beijerinck in 1898 on a non-bacterial pathogen infecting tobacco plants. Thus the viral world was discovered in two of the three domains of life, and our current understanding is that viruses represent the most abundant biological entities on the planet. The potential of bacteriophages for infection treatment have been recognized after the discoveries by Frederick Twort and Felix d'Hérelle in 1915 and 1917. Subsequent phage therapy developments, however, have been overshadowed by the remarkable success of antibiotics in infection control and treatment, and phage therapy research and development persisted mostly in the former Soviet Union countries, Russia and Georgia, as well as in France and Poland. The dramatic rise of antibiotic resistance and especially of multi-drug resistance among human and animal bacterial pathogens, however, challenged the position of antibiotics as a single most important pillar for infection control and treatment. Thus there is a renewed interest in phage therapy as a possible additive/alternative therapy, especially for the infections that resist routine antibiotic treatment. The basis for the revival of phage therapy is affected by a number of issues that need to be resolved before it can enter the arena, which is traditionally reserved for antibiotics. Probably the most important is the regulatory issue: How should phage therapy be regulated? Similarly to drugs? Then the co-evolving nature of phage-bacterial host relationship will be a major hurdle for the production of consistent phage formulae. Or should we resort to the phage products such as lysins and the corresponding engineered versions in order to have accurate and consistent delivery doses? We still have very limited knowledge about the pharmacodynamics of phage therapy. More data, obtained in animal models, are necessary to evaluate the phage therapy efficiency compared, for example, to antibiotics. Another aspect is the safety of phage therapy. How do phages interact with the immune system and to what costs, or benefits? What are the risks, in the course of phage therapy, of transduction of undesirable properties such as virulence or antibiotic resistance genes? How frequent is the development of bacterial host resistance during phage therapy? Understanding these and many other aspects of phage therapy, basic and applied, is the main subject of this Topic.

Public Health Mycobacteriology - Patricia T. Kent 1985

Metabolic Network Reconstruction and Modeling - Marco Fondi 2018-08-30

This volume looks at the latest methodologies used to study cellular metabolism with in silico approaches. The chapters in this book are divided into 3 parts: part I discusses tools and methods used for metabolic reconstructions and basic constraint-based metabolic modeling (CBMM); Part II explores protocols for the generation of experimental data for metabolic reconstruction and modeling, including transcriptomics, proteomics, and mutant generations; and Part III cover advanced techniques for quantitative modeling of cellular metabolism, including dynamic Flux Balance Analysis and multi-objective optimization. Written in the highly successful Methods in Molecular Biology series format, 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. Cutting-edge and thorough, Metabolic Network Reconstruction and Modeling: Methods and Protocols is a valuable resource for qualified investigators studying cellular metabolism, and novice researchers who want to start working with CBMM.

Access to Supercomputers - 1985

Bacterial Pangenomics - Alessio Mengoni 2015

Soilless Culture: Theory and Practice - Michael Raviv 2019-03-30

Soilless Culture: Theory and Practice, Second Edition, is the first authoritative reference book on both the theoretical and practical aspects of growing plants without the use of soil. It is the go-to source for those involved in this practice, focusing on hydroponics and advancements in technologies and methodologies. The book builds on the thorough presentation of both physical and chemical properties of various soilless growing media, also addressing how these properties affect plant performance in basic horticultural operations, such as irrigation and fertilization. In addition, the book describes the latest technical advancements and methodologies, including run-to-waste, re-circulation and closed systems. Provides a fully revised and updated edition with key insights on all current media types for plant production Explains the latest information on water and nutrient availability Includes rootstock/scion relationships in substrates Contains a chapter focusing specifically on hydroponics

Frankia and Actinorhizal Plants - M. Lalonde 2012-12-06

The fifth meeting of scientists working with Frankia and actinorhizal plants was held at Montmorency Forest of Laval University in Quebec from August 6-8, 1984. Results of research presented at the meeting are included in this special volume of Plant and Soil. The understanding of actinorhizal systems continue to increase, though work and use shops and discussions at this and similar meetings make it evident that this important subject remains open for fruitful investigation at all levels. Some important 'firsts' were reported at this meeting. The first extensive survey of Frankiae and their host specificity ranges from Asia was presented. This is of significance since Asia is a center of diversity for many actinorhizal host plant genera. A report that proto plasts of Frankia have been produced and regenerated for the first time improves the possibility for genetic manipulation of Frankia. It is also important to note the first report herein of successful mass inoculation of actinorhizal plants commercially for stabilization and reclamation of disturbed soils around hydroelectric power projects in Quebec. This heralds the transfer of actinorhizal technology to private and public users. The bacterial genus Frankia is easily recognized both in vivo and in vitro, and isolation of this organism has become routine. But, as yet, there are not sufficient biochemical, morphological, or anatomical criteria for establishing species.

Horizontal Gene Transfer - Maria Boekels Gogarten 2009-03-11

Horizontal gene transfer (HGT) events encompass processes as varied as the exchange of genetic material between microbes coexisting in the same environment, between symbiotic bacteria and their eukaryotic hosts, and the evolution of organelles by symbiosis, in which whole genomes are acquired. In Horizontal Gene Transfer: Genomes in Flux, expert researchers contribute an overview of HGT concepts as well as specific case histories that highlight the most current progress to inspire future work. Divided into three sections, the volume begins with an overview of terminology, concepts and the implications of HGT on current evolutionary thought and philosophy, and continues with methods involving computer and bioinformatics analyses of genomic data as well as molecular biology techniques for identifying, quantifying, and differentiating instances of HGT. A section of case studies follows, which provides detailed accounts of how HGT has shaped evolution across the diversity of organisms and organismal lineages. As a volume of the highly successful Methods in Molecular BiologyTM series, this work provides the kind of detailed description and implementation advice that is crucial for getting optimal results. Cutting-edge and thoroughly detailed, Horizontal Gene Transfer: Genomes in Flux examines how HGT has contributed to genome evolution and how understanding HGT impacts our ability to accurately reconstruct and comprehend the web-like evolutionary history in order to aid scientists in furthering their own research.