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2014-09-26

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Issues in Biological and Life Sciences Research: 2013 Edition

2013-05-01

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2022-06-15

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2023-04-20

this book explores the interplay between regulation and emerging technologies in the context of synthetic biology a developing field that promises great benefits and has already yielded fuels and medicines made with designer micro organisms for all its promise however it also poses various risks investigating the distinctiveness of synthetic biology and the regulatory issues that arise alison mclennan questions whether synthetic biology can be regulated within existing structures or whether new mechanisms are needed

Regulation of Synthetic Biology

2018-04-27

this is a book of a series on interdisciplinary topics on the biological and mathematical sciences the chapters correspond to selected papers on special research themes which have been presented at biomat 2013 international symposium on mathematical and computational biology which was held in the fields institute for research in mathematical sciences toronto ontario canada on november 04 08 2013 the treatment is both pedagogical and advanced in order to motivate research students as well as to fulfill the requirements of professional practitioners there are comprehensive reviews written by prominent scientific leaders of famous research groups contents population dynamics the princess and the pea the unexpected importance of movement algorithms rebecca tyson plankton nutrient interaction model with harvesting under constant environment samares pal and a chatterjee traveling wave solutions for a chemotaxis system f catrina and v m reyes g dynamics of a general stage structured n parallel food chains isam al darabsah and yuan yuan pattern recognition of biological phenomena complex data clustering from neural network architecture to theory and applications of nonlinear dynamics of pattern recognition guojun gan jialun yin yulia wang and jianhong wu dynamic and geometric modelling of biomolecular structures a two step kinetic model of insulin aggregation with a competitive inhibitor mark whidden allison ho and santiago schnell optimal control techniques in mathematical modelling of biological phenomena optimal control of resource coefficient in a parabolic population model j bintz h finotti and s lenhart optimization of costs for combating aedes aegypti in optimal time windows w o dias g a xavier d a p lima e f wanner and r t n cardoso dynamics of a varroa infested honey bee colonies model k o okosun computational biology probability distributions of gc content reflect the evolution of primate species marco v josé qi lu and juan r bobadilla mining the constraints of protein evolution fernando encinas and antonio basilio de miranda entropy measures based methods for the classification of protein domains into families and clans nicolas carels cecilia f mondaini and rubem p mondaini modelling physiological disorders

modelling of porous elastic and viscoelastic media and its application to the brain r begg j murley m kohandel and s sivaloganathan the mathematics of liver transplantation f a b coutinho e chaib m amaku m m burattini and e massad complexity of molecular signaling networks for various types of cancer and neurological diseases correlates with patient survivability d breitkreutz e a rietman p hinow m healey and j a tuszynski mathematical modelling of infectious diseases modelling malaria dynamics in temperate regions with long term incubation period kyeongah nah gergely röst and yongkuk kim a simulation of the u s influenza outbreak in 2009 2010 using a patch sir model based on airport transportation data d l wallace and m chen modelling directly transmitted infections considering age structured contact rate and vaccination h m yang and c h dezotti a general framework for agent based modelling with applications to infectious disease dynamics marek laskowski and seyed m moghadas analysis of the basic reproduction number from the initial growth phase of the outbreak in diseases caused by vectors r p sanches and e massad parameter estimation of a tuberculosis model in a patchy environment case of cameroon d p moualeu s bowong and j kürts an agent based modelling framework for tuberculosis infection with drug resistance aquino l espindola a s martinez and seyed m moghadas some extensions of the classical epidemic models fred brauer readership undergraduates graduates researchers and all practitioners on the interdisciplinary fields of mathematical biology biological physics and mathematical modelling of biosystems keywords mathematical biology biomathematics mathematical modelling of biosystems biological physics biophysics computational biology bioinformatics

BIOMAT 2013

2014-03-18

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2024-25 TGT/PGT/DSSSB Science Physics, Chemistry & Biology Solved Papers

2019-05-16

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2019-04-15

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ICSE 10 Years Solved Papers Class 10 for 2022 Examinations

2013-06-21

this report covers historical aspects of the regional development of orange roughy fisheries biology stock assessment ecosystem interactions and key management issues in light of debate regarding the sustainability of orange roughy fisheries as well as fisheries for other long lived deepwater species this review describes how by making the right choices and employing the best science available there are now some demonstrably sustainable orange roughy fisheries however there remain considerable challenges these include improving understanding of deepwater benthic communities in general their genetics and population distributions their dispersal and their ability to recover from fishery related and other impacts with regard to the direct management of the fisheries the report emphasizes important opportunities and needs to improve ageing and acoustic biomass estimation and to better understand the genetics and population structure of the stocks of orange roughy that are fished and managed

Global review of orange roughy (Hoplostethus atlanticus), their fisheries, biology and management

29-01-24

advances in centromere research and application 2013 edition is a scholarlybrief that delivers timely authoritative comprehensive and specialized information about zzzadditional research in a concise format the editors have built advances in centromere research and application 2013 edition on the vast information databases of scholarlynews you can expect the information about zzzadditional research in this book to be deeper than what you can access anywhere else as well as consistently reliable authoritative informed and relevant the content of advances in centromere research and application 2013 edition has been produced by the world s leading scientists engineers analysts research institutions and companies all of the content is from peer reviewed sources and all of it is written assembled and edited by the editors at scholarlyeditions and available exclusively from us you now have a source you can cite with authority confidence and credibility more information is available at scholarlyeditions com

Advances in Centromere Research and Application: 2013 Edition

2013-05-01

issues in addiction and eating disorders 2013 edition is a scholarlyeditions book that delivers timely authoritative and comprehensive information about gambling research the editors have built issues in addiction and eating disorders 2013 edition on the vast information databases of scholarlynews you can expect the information about gambling research in this book to be deeper than what you can access anywhere else as well as consistently reliable authoritative informed and relevant the content of issues in addiction and eating disorders 2013 edition has been produced by the world s leading scientists engineers analysts research institutions and companies all of the content is from peer reviewed sources and all of it is written assembled and edited by the editors at scholarlyeditions and

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2015-07-21

during the last century advances in the life sciences were used in the development of biological and chemical weapons in large scale state offensive programmes many of which targeted the nervous system this study questions whether the development of novel biological and chemical neuroweapons can be prevented as neuroscience progresses

Issues in Addiction and Eating Disorders: 2013 Edition

2014

this book focuses on state of the art microfluidic research in medical and biological applications the top level researchers in this research field explain carefully and clearly what can be done by using microfluidic devices beginners in the field undergraduates engineers biologists medical researchers will easily learn to understand microfluidic based medical and biological applications because a wide range of topics is summarized here it also helps experts to learn more about fields outside their own specialties the book covers many interesting subjects including cell separation protein crystallization single cell analysis cell diagnosis point of care testing immunoassay embyos worms on a chip and organ on a chip readers will be convinced that microfluidic devices have great potential for medical and biological applications

Neuroscience and the Future of Chemical-Biological Weapons

2019-04-25

encyclopedia of bioinformatics and computational biology abc of bioinformatics three volume set combines elements of computer science information technology mathematics statistics and biotechnology providing the methodology and in silico solutions to mine biological data and processes the book covers theory topics and applications with a special focus on integrative omics and systems biology the theoretical methodological underpinnings of bcb including phylogeny are covered as are more current areas of focus such as translational bioinformatics cheminformatics and environmental informatics finally applications provide guidance for commonly asked questions this major reference work spans basic and cutting edge methodologies authored by leaders in the field providing an invaluable resource for students scientists professionals in research institutes and a broad swath of researchers in biotechnology and the biomedical and pharmaceutical industries brings together information from computer science information technology mathematics statistics and biotechnology written and reviewed by leading experts in the field providing a unique and authoritative resource focuses on the main theoretical and methodological concepts before expanding on specific topics and applications includes interactive images multimedia tools and crosslinking to further resources and databases

Memoirs of the Institute of Scientific and Industrial Research, Osaka *University*

2018-08-21

development of powerful new high throughput technologies for probing the transcriptome proteome and metabolome is driving the rapid acquisition of information on the function of molecular systems the importance of these achievements cannot be understated they have transformed the nature of both biology and medicine despite this dramatic progress one of the greatest challenges that continues to confront modern biology is to understand how behavior at the level of genome proteome and metabolome determines physiological function at the level of cell tissue and organ in both health and disease because of the inherent complexity of biological systems the development analysis and validation of integrative computational models based directly on experimental data is necessary to achieve this understanding this approach known as systems biology integrates computational and experimental approaches through iterative development of mathematical models and experimental validation and testing the combination of these approaches allows for a mechanistic understanding of the function of complex biological systems in health and their dysfunction in disease the national heart lung and blood institute nhlbi has recognized the importance of the systems biology approach for understanding normal physiology and perturbations associated with heart lung blood and sleep diseases and disorders in 2006 nhlbi announced the exploratory program in systems biology followed in 2010 by the nhlbi systems biology collaborations the goal of these programs is to support collaborative teams of investigators in using experimental and computational strategies to integrate the component parts of biological networks and pathways into computational models that are based firmly on and validated using experimental data these validated models are then applied to gain insights into the mechanisms of altered system function in disease to generate novel hypotheses regarding these mechanisms that can be tested experimentally and to then use the results of experiments to refine the models the purpose of this research topic is to present the range of innovative new approaches being developed by investigators working in areas of systems biology that couple experimental and modeling studies to understand the cause and possible treatment of heart lung blood and sleep diseases and disorders this research topic will be of great interest to the cardiovascular research community as well as to the general community of systems biologists

Applications of Microfluidic Systems in Biology and Medicine

2014-11-21

this volume brings together new papers advancing contemporary debates in foundational conceptual and methodological issues in cognitive neuroscience the different perspectives presented in each chapter have previously been discussed between the authors as the volume builds on the experience of neural mechanisms nm online webinar series on the philosophy of neuroscience organized by the editors of this volume the contributed chapters pertain to five core areas in current philosophy of neuroscience it surveys the novel forms of explanation and prediction developed in cognitive neuroscience and looks at new concepts methods and techniques used in the field the book also highlights the metaphysical challenges raised by recent neuroscience and demonstrates the relation between neuroscience and mechanistic philosophy finally the book dives into the issue of neural computations and representations assembling contributions from leading philosophers of neuroscience this work draws upon the expertise of both established scholars and promising early career researchers

Encyclopedia of Bioinformatics and Computational Biology

2020-12-02

this combo package prepared by cbse exam experts at jagranjosh com is a kind of must have for the students appearing for class12th biology paper in the coming cbse board 2018 exam 1 this combo package includes cbse class 12 biology solved question paper 2017 cbse class 12 biology solved question paper 2016 set 3 cbse class 12 biology solved question paper 2015 set 2 cbse class 12 biology solved question paper 2014 set 1 cbse class 12 biology solved question paper 2013 set 1 cbse class 12 biology solved question paper 2012 set 1 2 the package strictly follows the pattern of cbse class 12th syllabus 3 it also contains the detailed explanation for each question solved 4 it will help you strengthen the concepts at class 12th level 5 this package will surely build your confidence to score excellent marks in following board exam paper key feature free class 12th biology 2012 solved paper ebook ideal to understand the exam pattern will give a clear idea of how to study and what to study for the exam

Systems Biology Approaches to Understanding the Cause and Treatment of Heart, Lung, Blood, and Sleep Disorders

2017-11-27

the second edition of nanotechnology in biology and medicine is intended to serve as an authoritative reference source for a broad audience involved in the research teaching learning and practice of nanotechnology in life sciences this technology which is on the scale of molecules has enabled the development of devices smaller and more efficient than anything currently available to understand complex biological nanosystems at the cellular level we urgently need to develop a next generation nanotechnology tool kit it is believed that the new advances in genetic engineering genomics proteomics medicine and biotechnology will depend on our mastering of nanotechnology in the coming decades the integration of nanotechnology material sciences molecular biology and medicine opens the possibility of detecting and manipulating atoms and molecules using nanodevices which have the potential for a wide variety of biological research topics and medical uses at the cellular level this book presents the most recent scientific and technological advances of nanotechnology for use in biology and medicine each chapter provides introductory material with an overview of the topic of interest a description of methods protocols instrumentation and applications and a collection of published data with an extensive list of references for further details the goal of this book is to provide a comprehensive overview of the most recent advances in instrumentation methods and applications in areas of nanobiotechnology integrating interdisciplinary research and development of interest to scientists engineers manufacturers teachers and students

Neural Mechanisms

2017-10-03

scholars and policymakers alike agree that innovation in the biosciences is key to future growth the field continues to shift and expand and it is certainly changing the way people live their lives in a variety of ways but despite the lion s share offederal research dollars being devoted to innovation in the biosciences the field has yet to live up to its billing as a source of economic productivity and growth with vast untapped potential to imagine and innovate in the biosciences adaptation of the innovative model is needed in the biologist s imagination william hoffman and leo furcht examine the history of innovation in the biosciences tracing technological innovation from the late eighteenth

century to the present and placing special emphasis on how and where technology evolves place is key to innovation from the early industrial age to the rise of the biotechnology industry in the second half of the twentieth century the book uses the distinct history of bioscientific innovation to discuss current trends as they relate to medicine agriculture biofuels stem cell research neuroscience and more ultimately hoffman and furcht argue that as things currently stand we fall short in our efforts to innovate in the biosciences our system of innovation is itself in need of innovation it needs to adapt to the massive changes brought about by converging technologies globalization in higher education as well as in finance and increases in entrepreneurship the biologist s imagination is both an analysis of past models for bioscience innovation and a forward looking original argument for how future models should be developed

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2014

the overarching contribution of this book is a review and assessment of the current and future impacts of globalization on the world s forests the work has been developed by the resources for the future task force for the international union of forest research organizations iufro four key themes are addressed the effect of globalization on forests including future trade flows plantations as the primary source of forest products and its consequences including plant breeding and forest health the effect of new products such as bio products and markets on forests and the emergence of forest ecosystem services and their impact on the landscape and human communities these four themes are examined in detail to map out the impacts of these trends for forests throughout the world and at multiple scales and how forest research needs to be adapted to address these trends overall the volume provides a major synthesis of current thinking and knowledge on the topic for advanced students as well as policy makers and professionals in the forest sector

Nanotechnology in Biology and Medicine

2014-09-19

biology and culture of portunid crabs of world seas provides an abundance of valuable first hand information about the diversity biology ecology culture of the portunid crabs of the word seas marine crabs play an important role directly or indirectly in the livelihood of millions of people around the world they have been reported to make up about 20 of all marine crustaceans caught farmed and consumed worldwide among these marine crabs portunid crabs or swimming crabs of the family portunidae class crustacea order decapoda infraorder brachyura assume greater significance in the marine industry owing to their delicate meat with nutritional qualities although several species of portunid crabs are edible and commercially important only a few species of scylla and portunus have been widely cultivated this is largely due to the lack of information on the biology of portunid crabs keeping this in view this new volume presents the biology and aquaculture of marine portunid crabs this volume will be of great use for researchers and students of disciplines such as fisheries science marine biology aquatic biology and fisheries and zoology and will also serve as a standard reference for college university and research libraries around the world

The Biologist's Imagination

2018-01-09

the oxford handbook of economics and human biology provides an extensive and insightful overview of how economic conditions affect human well being and how human health influences economic outcomes the book addresses both macro and micro factors as well as their interaction providing new understanding of complex relationships and developments in economic history and economic dynamics among the topics explored is how variation in height whether over time among different socioeconomic groups or in different locations is an important indicator of changes in economic growth and economic development levels of economic inequality and economic opportunities for individuals

Forests and Globalization

2016

designing eeg experiments for studying the brain design code and example datasets details the design of various brain experiments using electroencephalogram eeg providing guidelines for designing an eeg experiment it is primarily for researchers who want to venture into this field by designing their own experiments as well as those who are excited about neuroscience and want to explore various applications related to the brain the first chapter describes how to design an eeg experiment and details the various parameters that should be considered for success while remaining chapters provide experiment design for a number of neurological applications both clinical and behavioral as each chapter is accompanied with experiment design codes and example datasets those interested can quickly design their own experiments or use the current design for their own purposes helpful appendices provide various forms for one s experiment including recruitment forms feedback forms ethics forms and recommendations for related hardware equipment and software for data acquisition processing and analysis written to assist neuroscientists in experiment designs using eeg presents a step by step approach to designing both clinical and behavioral eeg experiments includes experiment design codes and example datasets provides inclusion and exclusion criteria to help correctly identify experiment subjects and the minimum number of samples includes appendices that provide recruitment forms ethics forms and various subjective tests associated with each of the chapters

Biology and Culture of Portunid Crabs of World Seas

2017-05-25

algebraic and combinatorial computational biology introduces students and researchers to a panorama of powerful and current methods for mathematical problem solving in modern computational biology presented in a modular format each topic introduces the biological foundations of the field covers specialized mathematical theory and concludes by highlighting connections with ongoing research particularly open questions the work addresses problems from gene regulation neuroscience phylogenetics molecular networks assembly and folding of biomolecular structures and the use of clustering methods in biology a number of these chapters are surveys of new topics that have not been previously compiled into one unified source these topics were selected because they highlight the use of technique from algebra and combinatorics that are becoming mainstream in the life sciences integrates a comprehensive selection of tools from computational biology into educational or research programs emphasizes practical problem solving through multiple exercises projects and spinoff computational simulations contains scalable material for use in undergraduate and graduate level

classes and research projects introduces the reader to freely available professional software supported by illustrative datasets and adaptable computer code

The Oxford Handbook of Economics and Human Biology

2018-10-08

two new volumes of methods in enzymology continue the legacy of this premier serial with quality chapters authored by leaders in the field circadian rhythms and biological clocks part a and part b is an exceptional resource for anybody interested in the general area of circadian rhythms as key elements of timekeeping are conserved in organisms across the phylogenetic tree and our understanding of circadian biology has benefited tremendously from work done in many species the volume provides a wide range of assays for different biological systems protocols are provided to assess clock function entrainment of the clock to stimuli such as light and food and output rhythms of behavior and physiology this volume also delves into the impact of circadian disruption on human health contributions are from leaders in the field who have made major discoveries using the methods presented here continues the legacy of this premier serial with quality chapters authored by leaders in the field covers research methods in biomineralization science keeping with the interdisciplinary nature of the circadian rhythm field the volume includes diverse approaches towards the study of rhythms from assays of biochemical reactions in unicellular organisms to monitoring of behavior in humans

Designing EEG Experiments for Studying the Brain

2015-01-30

a thorough understanding of pathogenic microorganisms and their interactions with host organisms is crucial to prevent infectious threats due to the fact that pathogen host interactions phis have critical roles in initiating and sustaining infections therefore the analysis of infection mechanisms through phis is indispensable to identify diagnostic biomarkers and next generation drug targets and then to develop strategic novel solutions against drug resistance and for personalized therapy traditional approaches are limited in capturing mechanisms of infection since they investigate hosts or pathogens individually on the other hand the systems biology approach focuses on the whole phi system and is more promising in capturing infection mechanisms here we bring together studies on the below listed sections to present the current picture of the research on computational systems biology of pathogen host interactions computational inference of phi networks using omics data computational prediction of phis text mining of phi data from the literature mathematical modeling and bioinformatic analysis of phis computational inference of phi networks using omics data gene regulatory metabolic and protein protein networks of phi systems are crucial for a thorough understanding of infection mechanisms great advances in molecular biology and biotechnology have allowed the production of related omics data experimentally many computational methods are emerging to infer molecular interaction networks of phi systems from the corresponding omics data computational prediction of phis due to the lack of experimentally found phi data many computational methods have been developed for the prediction of pathogen host protein protein interactions despite being emerging currently available experimental phi data are far from complete for a systems view of infection mechanisms through phis therefore computational methods are the main tools to predict new phis to this end the development of new computational methods is of great interest text mining of phi data from literature despite the recent development of many phi specific databases most data relevant to phis are still buried in the biomedical literature which demands for the use of text mining

techniques to unravel phis hidden in the literature only some rare efforts have been performed to achieve this aim therefore the development of novel text mining methods specific for phi data retrieval is of key importance for efficient use of the available literature mathematical modeling and bioinformatic analysis of phis after the reconstruction of phi networks experimentally and or computationally their mathematical modeling and detailed computational analysis is required using bioinformatics tools to get insights on infection mechanisms bioinformatics methods are increasingly applied to analyze the increasing amount of experimentally found and computationally predicted phi data

Algebraic and Combinatorial Computational Biology

2016-05-30

one of the key features of biological systems is complexity where the behavior of high level structures is more than the sum of the direct interactions between single components synthetic biologists aim to use rational design to build new systems that do not already exist in nature and that exhibit useful biological functions with different levels of complexity one such case is metabolic engineering where with the advent of genetic and protein engineering by supplying cells with chemically synthesized non natural amino acids and sugars as new building blocks it is now becoming feasible to introduce novel physical and chemical functions and properties into biological entities the rules of how complex behaviors arise however are not yet well understood for instance instead of considering cells as inert chassis in which synthetic devices could be easily operated to impart new functions the presence of these systems may impact cell physiology with reported effects on transcription translation metabolic fitness and optimal resource allocation the result of these changes in the chassis may be failure of the synthetic device unexpected or reduced device behavior or perhaps a more permissive environment in which the synthetic device is allowed to function while new efforts have already been made to increase standardization and characterization of biological components in order to have well known parts as building blocks for the construction of more complex devices also new strategies are emerging to better understand the biological dynamics underlying the phenomena we observe for example it has been shown that the features of single biological components i e promoter strength ribosome binding affinity etc change depending on the context where the sequences are allocated thus new technical approaches have been adopted to preserve single components activity as genomic insulation or the utilization of prediction algorithms able to take biological context into account there have been noteworthy advances for synthetic biology in clinical technologies biofuel production and pharmaceuticals production also metabolic engineering combined with microbial selection adaptation and fermentation processes allowed to make remarkable progress towards bio products formation such as bioethanol succinate malate and more interestingly heterologous products or even non natural metabolites however despite the many progresses it is still clear that ad hoc trial and error predominates over purely bottom up rational design approaches in the synthetic biology community in this scenario modelling approaches are often used as a descriptive tool rather than for the prediction of complex behaviors the initial confidence on a pure reductionist approach to the biological world has left space to a new and deeper investigation of the complexity of biological processes to gain new insights and broaden the categories of synthetic biology in this research topic we host contributions that explore and address two areas of synthetic biology at the intersection between rational design and natural complexity 1 the impact of synthetic devices on the host cell or chassis and 2 the impact of context on the synthetic devices particular attention will be given to the application of these principles to the rewiring of cell metabolism in a bottom up fashion to produce non natural metabolites or chemicals that should eventually serve as a substitute for petrol derived chemicals and on a long term view to provide economical ecological and

ethical solutions to today s energetic and societal challenges

Circadian Rhythms and Biological Clocks

2015-10-26

this collective monograph aims at contributing to an improved understanding of the epistemic presumptions sociocultural implications and historically backgrounds of the newly emerging and currently expanding approach of systems biology in doing so it offers empirically grounded valuable and reflexive information about a paradigmatic shift in the biosciences for a wide range of scientists working in the interdisciplinary areas of systems biology synthetic biology molecular biology biology the philosophy of science the sociology of science and scientific knowledge science and technology studies technology assessment and the like the authors of this monograph share the theoretical methodological premise that science is a culturally and socially embedded practice which characterizes our culture as a scientific one and at the same time draws its innovative potential from its socio cultural context this dialectic relationship lies at the heart of the current development of systems biology which is conceived as a so called successor of omics research and triggered by high throughput information technologies at the same time a need for a holistic conceptualization of complex biological processes emerges the title contextualizing systems biology suggests that this book analyzes the development and advent of systems biology from different theoretical and methodological perspectives we investigate a variety of contexts ranging from the analysis of cognitive contexts such as basic theoretical concepts to regulative contexts policies to the concrete application of a systems biology in the socio scientific context of a european research project in empirically analyzing these different and interrelated layers and dimensions of systems biology the scope of the book goes beyond present attempts to investigate the advent of new approaches in the biological sciences as it frames and assesses systems biology from an interdisciplinary and integrated perspective

Computational Systems Biology of Pathogen-Host Interactions

2015-12-18

microbial mat communities consist of dense populations of microorganisms embedded in exopolymers and or biomineralized solid phases and are often found in mm cm thick assemblages which can be stratified due to environmental gradients such as light oxygen or sulfide microbial mat communities are commonly observed under extreme environmental conditions deriving energy primarily from light and or reduced chemicals to drive autotrophic fixation of carbon dioxide microbial mat ecosystems are regarded as living analogues of primordial systems on earth and they often form perennial structures with conspicuous stratifications of microbial populations that can be studied in situ under stable conditions for many years consequently microbial mat communities are ideal natural laboratories and represent excellent model systems for studying microbial community structure and function microbial dynamics and interactions and discovery of new microorganisms with novel metabolic pathways potentially useful in future industrial and or medical applications due to their relative simplicity and organization microbial mat communities are often excellent testing grounds for new technologies in microbiology including micro sensor analysis stable isotope methodology and modern genomics integrative studies of microbial mat communities that combine modern biogeochemical and molecular biological methods with traditional microbiology macro ecological approaches and community network modeling will provide new and detailed insights regarding the systems biology of microbial mats and the complex interplay among individual populations and their

physicochemical environment these processes ultimately control the biogeochemical cycling of energy and or nutrients in microbial systems similarities in microbial community function across different types of communities from highly disparate environments may provide a deeper basis for understanding microbial community dynamics and the ecological role of specific microbial populations approaches and concepts developed in highly constrained relatively stable natural communities may also provide insights useful for studying and understanding more complex microbial communities

Synthetic Biology engineering complexity and refactoring cell capabilities

2016-04-11

encyclopedia of evolutionary biology four volume set is the definitive go to reference in the field of evolutionary biology it provides a fully comprehensive review of the field in an easy to search structure under the collective leadership of fifteen distinguished section editors it is comprised of articles written by leading experts in the field providing a full review of the current status of each topic the articles are up to date and fully illustrated with in text references that allow readers to easily access primary literature while all entries are authoritative and valuable to those with advanced understanding of evolutionary biology they are also intended to be accessible to both advanced undergraduate and graduate students broad topics include the history of evolutionary biology population genetics quantitative genetics speciation life history evolution evolution of sex and mating systems evolutionary biogeography evolutionary developmental biology molecular and genome evolution coevolution phylogenetic methods microbial evolution diversification of plants and fungi diversification of animals and applied evolution presents fully comprehensive content allowing easy access to fundamental information and links to primary research contains concise articles by leading experts in the field that ensures current coverage of each topic provides ancillary learning tools like tables illustrations and multimedia features to assist with the comprehension process

Contextualizing Systems Biology

2016-04-14

this reference book includes 24 chapters written by a group of experts in the different fields of microfungi and cover a broad range of topics on microfungi it provides the most updated information on the latest development in systematics and taxonomy of microfungi new techniques which were developed in the last ten years and their application in microfungal research after the international code of nomenclature for algae fungi and plants melbourne code was adopted by the eighteenth international botanical congress melbourne australia july 2011 it has had a profound impact on mycology and its research fungal nomenclature changes and its significance to fungal taxonomy and naming of microfungi in the future is discussed in detail since dual names system for fungi developing both sexual and asexual states and fungi developing only asexual state is no longer available the first five chapters will clarify some confusion and provides perspective views on the direction for future research the next nine chapters cover microfungi and their ecological roles or functions in the different habitats air indoor aquatic marine plants soils etc the remaining 13 chapters cover the relationship of microfungi and humans good and bad and usage or application microfungi in different industries such as food agriculture forestry green technology pharmaceutics and medicine as well as in our daily life the book bridges the gap between basic mycological research and applied mycology and provide readers a unique set of information and knowledge of microfungi generated from multiple angles in different fields of mycology

Systems biology and ecology of microbial mat communities

2016-03-18

this book provides a theoretical background of branching processes and discusses their biological applications branching processes are a well developed and powerful set of tools in the field of applied probability the range of applications considered includes molecular biology cellular biology human evolution and medicine the branching processes discussed include galton watson markov bellman harris multitype and general processes as an aid to understanding specific examples two introductory chapters and two glossaries are included that provide background material in mathematics and in biology the book will be of interest to scientists who work in quantitative modeling of biological systems particularly probabilists mathematical biologists biostatisticians cell biologists molecular biologists and bioinformaticians the authors are a mathematician and cell biologist who have collaborated for more than a decade in the field of branching processes in biology for this new edition this second expanded edition adds new material published during the last decade with nearly 200 new references more material has been added on infinitely dimensional multitype processes including the infinitely dimensional linear fractional case hypergeometric function treatment of the special case of the griffiths pakes infinite allele branching process has also been added there are additional applications of recent molecular processes and connections with systems biology are explored and a new chapter on genealogies of branching processes and their applications reviews of first edition this is a significant book on applications of branching processes in biology and it is highly recommended for those readers who are interested in the application and development of stochastic models particularly those with interests in cellular and molecular biology siam review vol 45 2 2003 this book will be very interesting and useful for mathematicians statisticians and biologists as well and especially for researchers developing mathematical methods in biology medicine and other natural sciences short book reviews of the isi vol 23 2 2003

Encyclopedia of Evolutionary Biology

2015-02-17

the understanding of biological complexity has been greatly facilitated by cross disciplinary holistic approaches that allow insights into the function and regulation of biological processes that cannot be captured by dissecting them into their individual components in addition the development of novel tools has dramatically increased our ability to interrogate information at the nucleic acid protein and metabolite level the integration and interpretation of disparate data sets however still remain a major challenge in systems biology roots provide an excellent model for studying physiological developmental and metabolic processes the availability of genetic resources along with sequenced genomes has allowed important discoveries in root biochemistry development and function roots are transparent allowing optical investigation of gene activity in individual cells and experimental manipulation in addition the predictable fate of cells emerging from the root meristem and the continuous development of roots throughout the life of the plant which permits simultaneous observation of different developmental stages provide ideal premises for the analysis of growth and differentiation moreover a genetically fixed cellular organization allows for studying the utilization of positional information and other non cell autonomous phenomena which are of utmost importance in plant development although their ontogeny is largely invariant under standardized experimental conditions roots possess an extraordinary capacity to respond to a plethora of environmental signals resulting in distinct phenotypic readouts this high phenotypic plasticity allows research into acclimative and adaptive strategies the understanding of which is crucial for germplasm enhancement

and crop improvement with the aim of providing a current snapshot on the function and development of roots at the systems level this research topic collated original research articles methods articles reviews mini reviews and perspective opinion and hypotheses articles that communicate breakthroughs in root biology as well as recent advances in research technologies and data analysis

Biology of Microfungi

2014-10-03

this innovative book provides a completely fresh exploration of bioinformatics investigating its complex interrelationship with biology and computer science it approaches bioinformatics from a unique perspective highlighting interdisciplinary gaps that often trap the unwary the book considers how the need for biological databases drove the evolution of bioinformatics it reviews bioinformatics basics including database formats data types and current analysis methods and examines key topics in computer science including data structures identifiers and algorithms reflecting on their use and abuse in bioinformatics bringing these disciplines together this book is an essential read for those who wish to better understand the challenges for bioinformatics at the interface of biology and computer science and how to bridge the gaps it will be an invaluable resource for advanced undergraduate and postgraduate students and for lecturers researchers and professionals with an interest in this fascinating fast moving discipline and the knotty problems that surround it

Branching Processes in Biology

2016-08-26

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Root systems biology

2016-09-09

transcription regulation is a complex process that can be considered and investigated from different perspectives traditionally and due to technical reasons including the evolution of our understanding of the underlying processes the main focus of the research was made on the regulation of expression through transcription factors tfs the proteins directly binding to dna on the other hand intensive research is going on in the field of chromatin structure remodeling and its involvement in the regulation whatever direction we select we can speak about several levels of regulation for instance concentrating on tfs we should consider multiple regulatory layers starting with signaling pathways and ending up with the tf binding sites in the promoters and other regulatory regions however it is obvious that the tf regulation also including the upstream processes represents a modest portion of all processes leading to gene expression for more comprehensive description of the gene regulation we need a systematic and holistic view which brings us to the importance of systems biology approaches advances in methodology especially in high throughput methods result in an ever growing mass of data which in many cases is still waiting for appropriate consideration moreover the accumulation of data is going faster than the development of algorithms for their systematic evaluation data and methods integration is indispensable for the acquiring a systematic as well as a systemic view in addition to the huge amount of molecular or genetic components of a biological system the even larger number of their interactions constitutes the enormous complexity of processes occurring in a living cell organ organism in systems biology these interactions are represented by networks

transcriptional or more generally gene regulatory networks are being generated from experimental chipseq data by reverse engineering from transcriptomics data or from computational predictions of transcription factor tf target gene relations while transcriptional networks are now available for many biological systems mathematical models to simulate their dynamic behavior have been successfully developed for metabolic and to some extent for signaling networks but relatively rarely for gene regulatory networks systems biology approaches provide new perspectives that raise new questions some of them address methodological problems others arise from the newly obtained understanding of the data these open questions and problems are also a subject of this research topic

Bioinformatics Challenges at the Interface of Biology and Computer Science

Biology-I (Zoology) 2022-23 TGT/PGT/GIC/LT/GDC/UPPCS/NVS/KVS/DSSSB

Systems Biology of Transcription Regulation

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