Introduction To Protein Architecture The Structural Biology Of Proteins 1st First Edition By Lesk Arthur M Published By Oxford University Press Usa 2001

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Computational Biophysics of Membrane Proteins - Carmen Domene 2016-11-30

Exploring current themes in modern computational and membrane protein biophysics, this book presents a comprehensive account of the fundamental principles underlying different methods and techniques used to describe the intriguing mechanisms by which membrane proteins function. The book discusses the experimental approaches employed to study these proteins, with chapters reviewing recent crucial structural advances that have allowed computational biophysicists to discern how these molecular machines work. The book then explores what computational methods are available to researchers and what these have taught us about three key families of membrane proteins: ion channels, transporters and receptors. The book is ideal for researchers in computational chemistry and computational biophysics.

Anatomy of Gene Regulation - Panagiotis A. Tsonis 2003-01-13

No longer simple line drawings on a page, molecular structures can now be viewed in full-figured glory, often in color and even with interactive possibilities. Anatomy of Gene Regulation is the first book to present the parts and processes of gene regulation at the three-dimensional level. Vivid structures of nucleic acids and their companion proteins are revealed in full-color, three-dimensional form. Beginning with a general introduction to three-dimensional structures, the book looks at the organization of the genome, the structure of DNA, DNA replication and transcription, splicing, protein synthesis, and ultimate protein death. Throughout, the text employs a discussion of genetics and structural mechanics. The concise and unique synthesis of information will offer insight into gene regulation, and into the development of methods to interfere with regulation at diseased states. This textbook and its accompanying web site are appropriate for both undergraduate and graduate students in genetics, molecular biology, structural biology, and

biochemistry courses.

Plant Structural Biology: Hormonal Regulations - Jan Hejátko 2018-08-17

After decades of dominance of genetics and genomics, the importance of structural biology is growing exponentially in the field of plant biology. The main objectives of this new book series is to “demystify” structural biology for plant researchers and to provide important insights into the basic molecular mechanisms underlying plant development through the diverse approaches utilized by structural biologists. The book series starts with a theme dedicated to hormonal signaling that has benefited from the application of structural biology. “Plant Structural Biology: Hormonal Regulations” provides up-to-date knowledge of the structural aspects of hormonal signal recognition, signal transduction, hormonal control of downstream regulatory pathways and hormonal crosstalk. The most distinctive features of this book as well as future titles is/will be to provide overview of cutting-edge research in the field of plant structural biology, and to serve as a compendium of various approaches that could be applied to problems being solved in modern plant biology. Last but not least, we hope this book will facilitate and broaden the community of (not only) plant scientists who are interested in structural biology approaches and tools. For these reasons, the style of this series is concise and general, in order to avoiding unnecessary details. Explanatory boxes describing the basics of specific approaches (e.g. X-ray crystallography, NMR, SAXS, molecular dynamics simulations, etc.) are included.

Mathematical Methods for Protein Structure Analysis and Design - Concettina Guerra 2004-04-16

The papers collected in this volume reproduce contributions by leading sch-arstoaninternationalschoolandworkshopwhichwasorganizedandheldwith thegoaloftakinga snapshotofadiscipline undertumultuous growth. Indeed, the area of protein folding, docking and alignment is developing in response to needs for a mix of heterogeneous expertise spanning biology, chemistry, mathematics, computer science, and statistics, among others. Some of the problems encountered in this area are not only important for the scienti?c challenges they pose, but also for the opportunities they disclose intermsofmedicalandindustrialexploitation. Atypicalexampleiso?eredby protein-drug interaction (docking), a problem posing daunting computational problems at the crossroads of geometry, physics and chemistry, and, at the same time, a problem with unimaginable implications for the pharmacopoeia of the future. The schoolfocused on problems posed by the study of the mechanisms - hind protein folding, and explored di?erent ways of attacking these problems under objective evaluations of the methods. Together with a relatively small core of consolidated knowledge and tools, important re?ections were brought to this e?ort by studies in a multitude of directions and approaches. It is obviously impossible to predict which, if any, among these techniques will prove completely successful, but it is precisely the implicit dialectic among them that best conveys the current ?avor of the ?eld. Such unique diversity and richness inspired the format of the meeting, and also explains the slight departure of the present volume from the typical format in this series: the exposition of the current sediment is complemented here by a selection of quali?ed specialized contributions.

Lecture Notes on Computational Structural Biology - Zhijun Wu 2008

While the field of computational structural biology or structural bioinformatics is rapidly developing, there are few books with a relatively complete coverage of such diverse research subjects studied in the field as X-ray crystallography computing, NMR structure determination, potential energy minimization, dynamics simulation, and knowledge-based modeling. This book helps fill the gap by providing such a survey on all the related subjects. Comprising a collection of lecture notes for a computational structural biology course for the Program on Bioinformatics and Computational Biology at Iowa State University, the book is in essence a comprehensive summary of computational structural biology based on the author's own extensive research experience, and a review of the subject from the perspective of a computer scientist or

applied mathematician. Readers will gain a deeper appreciation of the biological importance and mathematical novelty of the research in the field.

Introduction to Proteins - Amit Kessel 2018-03-22

Introduction to Proteins provides a comprehensive and state-of-the-art introduction to the structure, function, and motion of proteins for students, faculty, and researchers at all levels. The book covers proteins and enzymes across a wide range of contexts and applications, including medical disorders, drugs, toxins, chemical warfare, and animal behavior. Each chapter includes a Summary, Exercies, and References. New features in the thoroughly-updated second edition include: A brand-new chapter on enzymatic catalysis, describing enzyme biochemistry, classification, kinetics, thermodynamics, mechanisms, and applications in medicine and other industries. These are accompanied by multiple animations of biochemical reactions and mechanisms, accessible via embedded QR codes (which can be viewed by smartphones) An in-depth discussion of G-protein-coupled receptors (GPCRs) A wider-scale description of biochemical and biophysical methods for studying proteins, including fully accessible internet-based resources, such as databases and algorithms Animations of protein dynamics and conformational changes, accessible via embedded QR codes Additional features Extensive discussion of the energetics of protein folding, stability and interactions A comprehensive view of membrane proteins, with emphasis on structure-function relationship Coverage of intrinsically unstructured proteins, providing a complete, realistic view of the proteome and its underlying functions Exploration of industrial applications of protein engineering and rational drug design Each chapter includes a Summary, Exercies, and References Approximately 300 color images Downloadable solutions manual available at www.crcpress.com For more information, including all presentations, tables, animations, and exercises, as well as a complete teaching course on proteins' structure and function, please visit the author's website: http://ibis.tau.ac.il/wiki/nir_bental/index.php/Introduction_to_Proteins_Book. Praise for the first edition "This book captures, in a very accessible way, a growing body of literature on the structure, function and motion of proteins. This is a superb publication that would be very useful to undergraduates, graduate students, postdoctoral researchers, and instructors involved in structural biology or biophysics courses or in research on protein structure-function relationships." --David Sheehan, ChemBioChem, 2011 "Introduction to Proteins is an excellent, state-of-the-art choice for students, faculty, or researchers needing a monograph on protein structure. This is an immensely informative, thoroughly researched, up-to-date text, with broad coverage and remarkable depth. Introduction to Proteins would provide an excellent basis for an upper-level or graduate course on protein structure, and a valuable addition to the libraries of professionals interested in this centrally important field." --Eric Martz, Biochemistry and Molecular Biology Education, 2012

Nature's Robots - Charles Tanford 2003-11-27

Proteins are amazingly versatile molecules. They make the chemical reactions happen that form the basis for life, they transmit signals in the body, they identify and kill foreign invaders, they form the engines that make us move, and they record visual images. All of this is now common knowledge, but it was not so a hundred years ago. Nature's Robots is an authoritative history of protein science, from the origins of protein research in the nineteenth century, when the chemical constitution of 'protein' was first studied and heatedly debated and when there was as yet no glimmer of the functional potential of substances in the 'protein' category, to the determination of the first structures of individual proteins at atomic resolution - when positions of individual atoms were first specified exactly and bonding between neighbouring atoms precisely defined. Tanford and Reynolds, who themselves made major contributions to the golden age of protein science, have written a remarkably vivid account of this history. It is a fascinating story, involving heroes from the past, working mostly alone or in small groups, usually with little support from formal research groups. It is also a story that embraces a number of historically important scientific controversies. Written in clear and accessible prose, Nature's Robots will appeal to general readers with an interest in popular science, in addition to

professional scientists and historians of science.
Growing and Handling of Bacterial Cultures - Madhusmita Mishra 2019-12-04

Introduction To Protein Architecture - Arthur M. Lesk 2000-01-01 NULL

Introduction to Bioinformatics - Arthur Lesk 2019-05
The ideal text for biology students encountering bioinformatics for the first time, Introduction to Bioinformatics describes how recent technological advances in the field can be used as a powerful set of tools for receiving and analyzing biological data.

Membrane Protein Structure Determination - Jean-Jacques Lacapère 2010-08-06
Part I: Membrane Protein Purification 1. Characterization of Membrane Protein Preparations: Measurement of Detergent Content and Ligand Binding after Proteoliposomes Reconstitution Mariano A. Ostuni, Soria Iatmanen, David Teboul, Jean-Claude Robert, and Jean-Jacques Lacapère 2. Native Membrane Proteins Versus Yeast Recombinant: An Example, the Mitochondrial ADP/ATP Carrier Bertrand Arnou, Cécile Dahout-Gonzalez, Ludovic Pelosi, Guy J.-M. Lauquin, Gérard Brandolin, and Véronique Trézéguet 3. Bacterial Overexpressed Membrane Proteins: An Example, the TSPO Jean-Claude Robert and Jean-Jacques Lacapère 4. Insect Cell Versus Bacterial Overexpressed Membrane Proteins: An Example, the Human ABCG2 Transporter Alexandre Pozza, José M. Perez-Victoria, and Attilio Di Pietro Part II: X-Ray Crystallography 5. Crystallography of Membrane Proteins: From Crystallization to Structure Aurélien Deniaud, Ekaterina Moiseeva, Valentin Gordeliy, and Eva Pebay-Peyroula 6. Structural Approaches of the Mitochondrial Carrier Family Hughes Nury, Iulia Blesneac, Stephanie Ravaud, and Eva Pebay-Peyroula 7. What Can Be Learned about the Function of a Single Protein from Its Various X-Ray Structures: The Example of the Sarcoplasmic Calcium Pump Jesper Vuust Møller, Claus Olesen, Anne-Marie Lund Winther, and Poul Nissen 8. Toward Drug Design: Recent Progress in the Structure of GPCR, a Membrane Protein with High Potential as a Pharmaceutical Target Vadim Cherezov, Enrique Abola, and Raymond C. Stevens Part III: Electron Microscopy 9. Observation of Membrane Proteins in situ: AQPcic, the Insect Aquaporin Example Daniel Thomas and Annie Cavalier 10. Two-Dimensional Crystallization of Integral Membrane Proteins for Electron Crystallography David L. Stokes, William J. Rice, Minghui Hu, Changki Kim, and Iban Ubarretxena 11. Structure Determination of Membrane Protein by Both Cryo Electron Tomography and Single Particle Analysis Sylvain Trépout, Jean-Christophe Taveau, and Olivier Lambert 12. Electron Microscope Tomography of Native Membranes Gabriel Péranzi, Cedric Messaoudi, Leeyah Issop, and Jean-Jacques Lacapère 13. From Electron Microscopy Maps to Atomic Structures Using Normal Mode-Based Fitting Konrad Hinsen, Edward Beaumont, Bertrand Fournier, and Jean-Jacques Lacapère Part IV: Nuclear Magnetic Resonance 14. Determination of Membrane Protein Structures Using Solution and Solid-State NMR Pierre Montaville and Nadège Jamin 15. Membrane Protein Fragments Reveal Both Secondary and Tertiary Structure of Membrane Proteins Philip L. Yeagle and Arlene D. Albert 16. What Can We Learn From a Small Regulatory Membrane Protein? Gianluigi Veglia, Kim N. Ha, Lei Shi, Raffaello Verardi, and Nathaniel J. Traaseth 17. Solution-State NMR Spectroscopy for Investigating 3D Structure of Membrane Proteins in Detergent Micelles: Structure of the Klebsiella pneumoniae Outer Membrane Protein, KpOmpA Marie Renault, Olivier Saurel, Pascal Demange, Virginie Reat, and Alain Milon 18. NMR Spectroscopy of Lipid Bilayers Axelle Grélard, Cécile Loudet, Anna Diller, and Erick J. Dufourc Part V: Molecular Modelling 19. Critical Review of General Guidelines for Membrane Proteins Model Building and Analysis Catherine Etchebest and Gaelle Debret 20. 3D-Structural Models of Transmembrane Proteins Alexandre G. de Brevern 21. Molecular Dynamics of Membrane Peptides and Proteins: Principles and Comparison to Experimental Data Patrick F.J. Fuchs 22. Membrane Protein Dynamics from Femtoseconds to Seconds Christian Kandt and Luca Monticelli 23. The Family of G Protein-Coupled Receptors: An Example of Membrane Proteins Irina G. Tikhonova and Daniel Fourmy

Introduction to Protein Science - Arthur Lesk 2010-03-25
Starting by describing the structure of proteins and explaining how these structures can be studied, this book goes on to illustrate the wide range of protein functions by showing how the shape of a protein is intimately linked to its function.

Elements of Molecular Neurobiology - C. U. M. Smith 2003-06-13
This edition of the popular text incorporates recent advances in neurobiology enabled by modern molecular biology techniques. Understanding how the brain works from a molecular level allows research to better understand behaviours, cognition, and neuropathologies. Since the appearance six years ago of the second edition, much more has been learned about the molecular biology of development and its relations with early evolution. This "evodevo" (as it has come to be known) framework also has a great deal of bearing on our understanding of neuropathologies as dysfunction of early onset genes can cause neurodegeneration in later life. Advances in our understanding of the genomes and proteomes of a number of organisms also greatly influence our understanding of neurobiology. * Well known and widely used as a text throughout the UK, good reviews from students and lecturers. * Good complement to Fundementals of Psychopharmacology by Brian Leonard. This book will be of particular interest to biomedical undergraduates undertaking a neuroscience unit, neuroscience postgraduates, physiologists, pharmacologists. It is also a useful basic reference for university libraries. Maurice Elphick, Queen Mary, University of London "I do like this book and it is the recommended textbook for my course in Molecular Neuroscience. The major strength of the book is the overall simplicity of the format both in terms of layout and diagrams."

Introduction to Proteins - Amit Kessel 2010-12-17
As the tools and techniques of structural biophysics assume greater roles in biological research and a range of application areas, learning how proteins behave becomes crucial to understanding their connection to the most basic and important aspects of life. With more than 350 color images throughout, Introduction to Proteins: Structure, Function, and Motion presents a unified, in-depth treatment of the relationship between the structure, dynamics, and function of proteins. Taking a structural–biophysical approach, the authors discuss the molecular interactions and thermodynamic changes that transpire in these highly complex molecules. The text incorporates various biochemical, physical, functional, and medical aspects. It covers different levels of protein structure, current methods for structure determination, energetics of protein structure, protein folding and folded state dynamics, and the functions of intrinsically unstructured proteins. The authors also clarify the structure–function relationship of proteins by presenting the principles of protein action in the form of guidelines. This comprehensive, color book uses numerous proteins as examples to illustrate the topics and principles and to show how proteins can be analyzed in multiple ways. It refers to many everyday applications of proteins and enzymes in medical disorders, drugs, toxins, chemical warfare, and animal behavior. Downloadable questions for each chapter are available at CRC Press Online.

Fibrous Proteins: Structures and Mechanisms - David A.D. Parry 2017-01-18
This book provides the readers with an up-to-date review of the design, structure and function of a representative selection of fibrous proteins in both health and disease. The importance of the α-helical coiled coil, a conformational motif based on the heptad repeat in the amino acid sequence of all α-fibrous proteins (and parts of some globular proteins) is underlined by three Chapters devoted to its design, structure, function and topology. Specific proteins covered in the text and which depend on the coiled coil for their structure and function, include the intermediate filament proteins, tropomyosin, myosin, paramyosin, fibrin and members of the spectrin superfamily. Also described are fibrous proteins based on the β-pleated sheet and collagen conformations. Recombinant structural proteins, especially of silk and collagen, are discussed in the context of developing new biomaterials with varied applications. Established researchers and postgraduate students in the fields of protein chemistry, biochemistry and structural biophysics will find Fibrous Proteins:

Structures and Mechanisms to be an invaluable collection of topical reviews that describe the basic advances made in the field of fibrous proteins over the past decade. This book, written by recognized authorities in the field, provides a clear account of the current status of fibrous protein research and, in addition, establishes the basis for deciding the most appropriate directions for future activity, including the applications of protein engineering and the commercial exploitation of new biomaterials.

Introduction to Genomics - Arthur M. Lesk 2007

Introduction to Genomics is a fascinating insight into what can be revealed from the study of genomes: how organisms differ or match; how different organisms evolved; how the genome is constructed and how it operates; and what our understanding of genomics means in terms of our future health and wellbeing.

Textbook of Structural Biology - Anders Liljas

This book provides a comprehensive coverage of the basic principles of structural biology, as well as an up-to-date summary of some main directions of research in the field. The relationship between structure and function is described in detail for soluble proteins, membrane proteins, membranes, and nucleic acids. There are several books covering protein structure and function, but none that give a complete picture, including nucleic acids, lipids, membranes and carbohydrates, all being of central importance in structural biology. The book covers state-of-the-art research in various areas. It is unique for its breadth of coverage by experts in the fields. The book is richly illustrated with more than 400 color figures to highlight the wide range of structures.

Homology Molecular Modeling - Rafael Trindade Maia 2021-03-10

Homology modeling is an extremely useful and versatile technique that is gaining more and more space and demand in research in computational and theoretical biology. This book, “Homology Molecular Modeling - Perspectives and Applications”, brings together unpublished chapters on this technique. In this book, 7 chapters are intimately related to the theme of molecular modeling, carefully selected and edited for academic and scientific readers. It is an indispensable read for anyone interested in the areas of bioinformatics and computational biology. Divided into 4 sections, the reader will have a didactic and comprehensive view of the theme, with updated and relevant concepts on the subject. This book was organized from researchers to researchers with the aim of spreading the fascinating area of molecular modeling by homology.

Mass Spectrometry in Structural Biology and Biophysics - Igor A. Kaltashov 2012-04-03

The definitive guide to mass spectrometry techniques in biology and biophysics The use of mass spectrometry (MS) to study the architecture and dynamics of proteins is increasingly common within the biophysical community, and Mass Spectrometry in Structural Biology and Biophysics: Architecture, Dynamics, and Interaction of Biomolecules, Second Edition provides readers with detailed, systematic coverage of the current state of the art. Offering an unrivalled overview of modern MS-based armamentarium that can be used to solve the most challenging problems in biophysics, structural biology, and biopharmaceuticals, the book is a practical guide to understanding the role of MS techniques in biophysical research. Designed to meet the needs of both academic and industrial researchers, it makes mass spectrometry accessible to professionals in a range of fields, including biopharmaceuticals. This new edition has been significantly expanded and updated to include the most recent experimental methodologies and techniques, MS applications in biophysics and structural biology, methods for studying higher order structure and dynamics of proteins, an examination of other biopolymers and synthetic polymers, such as nucleic acids and oligosaccharides, and much more. Featuring high-quality illustrations that illuminate the concepts described in the text, as well as extensive references that enable the reader to pursue further study, Mass Spectrometry in Structural Biology and Biophysics is an indispensable resource for researchers and graduate students working in biophysics, structural biology, protein chemistry, and related fields.

Computational Methods for Protein Structure Prediction and Modeling - Ying Xu 2010-05-05

Volume Two of this two-volume sequence presents a comprehensive

overview of protein structure prediction methods and includes protein threading, De novo methods, applications to membrane proteins and protein complexes, structure-based drug design, as well as structure prediction as a systems problem. A series of appendices review the biological and chemical basics related to protein structure, computer science for structural informatics, and prerequisite mathematics and statistics.

Fundamentals of Protein Structure and Function - Engelbert Buxbaum 2015-11-27

This book serves as an introduction to protein structure and function. Starting with their makeup from simple building blocks, called amino acids, the 3-dimensional structure of proteins is explained. This leads to a discussion how misfolding of proteins causes diseases like cancer, various encephalopathies, or diabetes. Enzymology and modern concepts of enzyme kinetics are then introduced, taking into account the physiological, pharmacological and medical significance of this often neglected topic. This is followed by thorough coverage of hæmoglobin and myoglobin, immunoproteins, motor proteins and movement, cell-cell interactions, molecular chaperones and chaperonins, transport of proteins to various cell compartments and solute transport across biological membranes. Proteins in the laboratory are also covered, including a detailed description of the purification and determination of proteins, as well as their characterisation for size and shape, structure and molecular interactions. The book emphasises the link between protein structure, physiological function and medical significance. This book can be used for graduate and advanced undergraduate classes covering protein structure and function and as an introductory text for researchers in protein biochemistry, molecular and cell biology, chemistry, biophysics, biomedicine and related courses. About the author: Dr. Buxbaum is a biochemist with interest in enzymology and protein science. He has been working on the biochemistry of membrane transport proteins for nearly thirty years and has taught courses in biochemistry and biomedicine at several universities.

Introduction to Protein Science - Arthur Lesk 2016-01-14

Not only are proteins the fundamental building blocks of all life forms, but they also have a wide range of functions - from forming enzymes acting as catalysts for specific reactions, to crucial molecules such as antibodies in the immune system, and as signalling molecules between cells. Introduction to Protein Science, 3rd edition provides a rich and broad introduction to this fascinating field by covering not only the structureand function of proteins, but also the methods and experimental techniques used to study them. The practical applications of our knowledge to diverse fields such as biotechnology and medicine are emphasizedthroughout, to help students appreciate the relevance of the subject to the real world.

Protein Structure - Eshel Faraggi 2012-04-20

Since the dawn of recorded history, and probably even before, men and women have been grasping at the mechanisms by which they themselves exist. Only relatively recently, did this grasp yield anything of substance, and only within the last several decades did the proteins play a pivotal role in this existence. In this expose on the topic of protein structure some of the current issues in this scientific field are discussed. The aim is that a non-expert can gain some appreciation for the intricacies involved, and in the current state of affairs. The expert meanwhile, we hope, can gain a deeper understanding of the topic.

Nmr In Structural Biology: A Collection Of Papers By Kurt Wuthrich - Kurt Wuthrich 1995-07-31

The volume presents a survey of the research by Kurt Wüthrich and his associates during the period 1965 to 1994. A selection of reprints of original papers on the use of NMR spectroscopy in structural biology is supplemented with an introduction, which outlines the foundations and the historical development of the use of NMR spectroscopy for the determination of three-dimensional structures of biological macromolecules in solution. The original papers are presented in groups highlighting protein structure determination by NMR, studies of dynamic properties and hydration of biological macromolecules, and practical applications of the NMR methodology in fields such as enzymology, transcriptional regulation, immunosuppression and protein folding.

Introduction to Genomics - Arthur M. Lesk 2017
Our genome is the blueprint for our existence: it encodes all the information we need to develop from a single cell into a hugely complicated functional organism. Yet it is more than a static information store: our genome is a dynamic, tightly-regulated collection of genes, which switch on and off in many combinations to give the variety of cells from which our bodies are formed. But how do we identify the genes that make up our genome? How do we determine their function? And how do different genes form the regulatory networks that direct the processes of life? Introduction to Genomics is the most up-to-date and complete textbook for students approaching the subject for the first time. Lesk's engaging writing style brings a narrative to a disparate field of study and offers a fascinating insight into what can be revealed from the study of genomes. The book covers: the similarities and differences between organisms; how different organisms evolved; how the genome is constructed and how it operates; and what our understanding of genomics means in terms of our future health and wellbeing. The Online Resource Center accompanying Introduction to Genomics features: For students: *Extensive and imaginative weblems (web-based problems) for each chapter designed to give you practice with the tools required for further study and research in the field *Hints and answers to end-of-chapter problems and exercises support your self-directed learning *Guided tour of websites and major archival databanks in genomics offer a wealth of resources to springboard your own research *Journal club: links to related research articles on topics covered in the book are paired with engaging questions to improve your interpretation of the primary literature *Rotating figures allow you to visualize complex structures For instructors: *Downloadable figures from the book.

Structure and Mechanism in Protein Science - Alan Fersht 2017
This book is a guide for advanced undergraduates, post-graduates and researchers to the fundamental principles in studying kinetics and mechanism of processes concerning proteins. It provides a rare broad overview that concentrates on fundamental principles and understanding underlying the physics and chemistry. It is a single author text by someone who has direct experience in all of the areas covered.

Membrane Structural Biology - Mary Luckey 2014-02-24
This textbook provides a strong foundation and a clear overview for students of membrane biology and an invaluable synthesis of cutting-edge research for working scientists. The text retains its clear and engaging style, providing a solid background in membrane biochemistry, while also incorporating the approaches of biophysics, genetics and cell biology to investigations of membrane structure, function and biogenesis to provide a unique overview of this fast-moving field. A wealth of new high resolution structures of membrane proteins are presented, including the Na/K pump and a receptor-G protein complex, offering exciting insights into how they function. All key tools of current membrane research are described, including detergents and model systems, bioinformatics, protein-folding methodology, crystallography and diffraction, and molecular modeling. This comprehensive and up-to-date text, emphasising the correlations between membrane research and human health, provides a solid foundation for all those working in this field.

Protein Structure and Function - Gregory A. Petsko 2004
Each title in the 'Primers in Biology' series is constructed on a modular principle that is intended to make them easy to teach from, to learn from, and to use for reference.

Proteins - David Whitford 2013-04-25
Proteins: Structure and Function is a comprehensive introduction to the study of proteins and their importance to modern biochemistry. Each chapter addresses the structure and function of proteins with a definitive theme designed to enhance student understanding. Opening with a brief historical overview of the subject the book moves on to discuss the ‘building blocks’ of proteins and their respective chemical and physical properties. Later chapters explore experimental and computational methods of comparing proteins, methods of protein purification and protein folding and stability. The latest developments in the field are included and key concepts introduced in a user-friendly way to ensure that students are able to grasp the essentials before moving on to more

advanced study and analysis of proteins. An invaluable resource for students of Biochemistry, Molecular Biology, Medicine and Chemistry providing a modern approach to the subject of Proteins.

Computational Structural Biology - Torsten Schwede 2008

This is a comprehensive introduction to Landau-Lifshitz equations and Landau-Lifshitz-Maxwell equations, beginning with the work by Yulin Zhou and Boling Guo in the early 1980s and including most of the work done by this Chinese group led by Zhou and Guo since. The book focuses on aspects such as the existence of weak solutions in multi dimensions, existence and uniqueness of smooth solutions in one dimension, relations with harmonic map heat flows, partial regularity and long time behaviors. The book is a valuable reference book for those who are interested in partial differential equations, geometric analysis and mathematical physics. It may also be used as an advanced textbook by graduate students in these fields.

Advances in Protein Molecular and Structural Biology Methods - Timir Tripathi 2022-01-14

Advances in Protein Molecular and Structural Biology Methods offers a complete overview of the latest tools and methods applicable to the study of proteins at the molecular and structural level. The book begins with sections exploring tools to optimize recombinant protein expression and biophysical techniques such as fluorescence spectroscopy, NMR, mass spectrometry, cryo-electron microscopy, and X-ray crystallography. It then moves towards computational approaches, considering structural bioinformatics, molecular dynamics simulations, and deep machine learning technologies. The book also covers methods applied to intrinsically disordered proteins (IDPs)followed by chapters on protein interaction networks, protein function, and protein design and engineering. It provides researchers with an extensive toolkit of methods and techniques to draw from when conducting their own experimental work, taking them from foundational concepts to practical application. Presents a thorough overview of the latest and emerging methods and technologies for protein study Explores biophysical techniques, including nuclear magnetic resonance, X-ray crystallography, and cryo-electron microscopy Includes computational and machine learning methods Features a section dedicated to tools and techniques specific to studying intrinsically disordered proteins

Structural Biology of Membrane Proteins - Reinhard Grisshammer 2007-10-31

In the last few years there have been many exciting and innovative developments in the field of membrane protein structure and this trend is set to continue. Structural Biology of Membrane Proteins is a new monograph covering a wide range of topics with contributions from leading experts in the field. The book is split into three sections: the first discusses topics such as expression, purification and crystallisation; the second covers characterisation techniques and the final section looks at new protein structures. The book will hence have wide appeal to researchers working in and around the field and provide an up-to-date reference source. Introductory sections to each topic are accompanied by more detailed discussions for the more experienced biochemist. Detailed descriptions of experimental methods are included to demonstrate practical approaches to membrane protein structure projects. The book also offers an up-to-date reference source in addition to descriptions of new and emerging developments, including state-of-the-art techniques for solving membrane protein structures. Structural Biology of Membrane Proteins encompasses both basic introductions and detailed descriptions of themes and should appeal to a wide range of biochemical scientists, both experienced and beginner.

Protein Reviews - M. Zouhair Atassi 2021-03-01

The Protein Reviews series serves as a publication vehicle for reviews that focus on crucial contemporary and vital aspects of protein structure, function, evolution and genetics. Volumes are published online first, prior to publication in a printed book. Chapters are selected according to their importance to the understanding of biological systems, relevance to the unravelling of issues associated with health and disease, or impact on scientific or technological advances and developments. Volume 21 presents eight review chapters authored by experts in the related fields. The first chapter covers the enzyme squalene monooxygenase and lipid

levels and its relevance in health and disease. Chapter two presents a systematic analysis of the structural and functional aspects of heteromeric solute carriers. The third chapter provides a review of the role of CI- in type IV collagen assembly, function, and disease, including future directions for studies. This is followed by a summary in chapter four about the recent progress on defining the roles of the Slit-Robo signaling in bone metabolism and the possible roles of the interaction between Robo and neural epidermal growth factor-like proteins. Chapter five discusses recent data about the evolutionary aspects on structural differences between humans and the nematode in relation to previous knowledge of core proteins and GAG-attachment sites in Chn and CS proteoglycans of C.elegans and humans. The sixth chapter summarizes the immunochemical character of the IGHV1-69-derived RFs and the recognition mechanism of the IGHV1-69-derived RFs. Chapter seven covers regulated alternative translocation and its role as an emerging mechanism to regulate transmembrane proteins. Finally, chapter eight reviews current progress on IL-36 protein and biology and novel investigative tools. This volume is intended for research scientists, clinicians, physicians and graduate students in the fields of biochemistry, cell biology, molecular biology, immunology and genetics.

Structural Bioinformatics - Jenny Gu 2011-09-20

Structural Bioinformatics was the first major effort to showthe application of the principles and basic knowledge of the largerfield of bioinformatics to questions focusing on macromolecularstructure, such as the prediction of protein structure and howproteins carry out cellular functions, and how the application ofbioinformatics to these life science issues can improve healthcareby accelerating drug discovery and development. Designed primarilyas a reference, the first edition nevertheless saw widespread useas a textbook in graduate and undergraduate university coursesdealing with the theories and associated algorithms, resources, andtools used in the analysis, prediction, and theoreticalunderpinnings of DNA, RNA, and proteins. This new edition contains not only thorough updates of theadvances in structural bioinformatics since publication of thefirst edition, but also features eleven new chapters dealing withfrontier areas of high scientific impact, including: sampling andsearch techniques; use of mass spectrometry; genome functionalannotation; and much more. Offering detailed coverage for practitioners while remainingaccessible to the novice, Structural Bioinformatics, SecondEdition is a valuable resource and an excellent textbook for arange of readers in the bioinformatics and advanced biologyfields. Praise for the previous edition: "This book is a gold mine of fundamental and practicalinformation in an area not previously well represented in bookform." —Biochemistry and Molecular Education "... destined to become a classic reference work for workers atall levels in structural bioinformatics...recommended with greatenthusiasm for educators, researchers, and graduatestudents." —BAMBED "...a useful and timely summary of a rapidly expandingfield." —Nature Structural Biology "...a terrific job in this timely creation of a compilation ofarticles that appropriately addresses this issue." —Briefings in Bioinformatics

Molecular Biology of the Cell - Bruce Alberts 2004

Introduction to Protein Structure - Carl Ivar Branden 2012-03-26

The VitalBook e-book of Introduction to Protein Structure, Second Edition is inly available in the US and Canada at the present time. To purchase or rent please visit http://store.vitalsource.com/show/9780815323051Introduction to Protein Structure provides an account of the principles of protein structure, with examples of key proteins in their bio

Introduction to Bioinformatics - Arthur Lesk 2014

Lesk provides an accessible and thorough introduction to a subject which is becoming a fundamental part of biological science today. The text generates an understanding of the biological background of bioinformatics.

Genome Transcriptome and Proteome Analysis - Alain Bernot 2005-11-01

Genome Transcriptome and Proteome Analysis is a concise introduction to the subject, successfully bringing together these three key areas of

research. Starting with a revision of molecular genetics the book offers clear explanations of the tools and techniques widely used in genome, transcriptome and proteome analysis. Subsequent chapters offer a broad overview of linkage maps, physical maps and genome sequencing, with a final discussion on the identification of genes responsible for disease. An invaluable introduction to the basic concepts of the subject, this text offers the student an excellent overview of current research methods and applications and is a good starting point for those new to the area. A clear, concise introduction to the subject of modern genomic analysis A technology-oriented approach including the latest developments in the field Invaluable to those students taking courses in Bioinformatics, Human Genetics, Biochemistry and Molecular Biology

Algorithms in Structural Molecular Biology - Bruce R. Donald 2011-06-01

An overview of algorithms important to computational structural biology that addresses such topics as NMR and design and analysis of proteins. Using the tools of information technology to understand the molecular machinery of the cell offers both challenges and opportunities to computational scientists. Over the past decade, novel algorithms have been developed both for analyzing biological data and for synthetic biology problems such as protein engineering. This book explains the algorithmic foundations and computational approaches underlying areas of structural biology including NMR (nuclear magnetic resonance); X-ray crystallography; and the design and analysis of proteins, peptides, and small molecules. Each chapter offers a concise overview of important concepts, focusing on a key topic in the field. Four chapters offer a short course in algorithmic and computational issues related to NMR structural biology, giving the reader a useful toolkit with which to approach the fascinating yet thorny computational problems in this area. A recurrent theme is understanding the interplay between biophysical experiments and computational algorithms. The text emphasizes the mathematical foundations of structural biology while maintaining a balance between algorithms and a nuanced understanding of experimental data. Three emerging areas, particularly fertile ground for research students, are highlighted: NMR methodology, design of proteins and other molecules, and the modeling of protein flexibility. The next generation of computational structural biologists will need training in geometric algorithms, provably good approximation algorithms, scientific computation, and an array of techniques for handling noise and uncertainty in combinatorial geometry and computational biophysics. This book is an essential guide for young scientists on their way to research success in this exciting field.

Protein Architecture - Arthur M. Lesk 1991

Modern computer graphics transforms protein structures into visually exciting images. 'Protein Architecture: A Practical Approach' shows the reader how to visualize protein structures, and how to design an illustration to help understand and appreciate the variety of protein folding patterns.