Cell Biology Structure And Replication Of Genetic Materials V 2 A Comprehensive Treatise Cell Biology A Comprehensive Treatise

The Togaviruses: Biology, Structure, Replication deals with the biology, structure, and replication of rotaviruses. This book covers topics such as the biochemistry of rotaviruses and the biological and medical challenges they pose. It also gives an account of their mechanisms of replication that might lead to perceptions of the capacity to solve biological and epidemiological problems through the concepts and technology of molecular biology. This text is comprised of 21 chapters that explore clinical details, routine procedures for diagnostic virus isolation and identification and for serological tests; immunological host responses; the role of interferons; antiviral chemotherapy; and vaccine development. The discussion begins with a historical overview of arboviruses, followed by a description of all the viruses that belong to Togaviridae. These include alpha- and flaviviruses, rubiviruses, pestiviruses, and other ""non-arbo"" togaviruses. The next chapters focus on the arthropod-vertebrate-arthropod transmission cycle and its experimental equivalents, along with the viruses' structure, composition, and replication. This book concludes with a summary of physicochemical, morphological, and clinical data on non-arbo togaviruses. This reference material will be of interest to physicians, veterinarians, ecologists, entomologists, epidemiologists, cell biologists, immunologists, virologists, physical chemists, biochemists, molecular biologists, and geneticists.

In all eukaryotic cells, each fundamental processcycle progression and its control, protein secretion and targeting, transcription and its regulation, mRNA processing, and DNA replicationaccomplished by essentially identical cellular machinery composed of essentially identical protein components. This conservation of function has catapulted the yeasts Saccharomyces cerevisiae and Schizosaccharomyces pombe from parochial backwaters to the forefront of experimental molecular biology: What is true for a yeast is true for an elephant, and in experiments you can get the answer a lot faster from a yeast. This burgeoning appreciation of yeasts as model systems for the study of fundamental cellular processes has highlighted the need for an update of the seminal 1981 monograph The Molecular Biology of the Yeast Saccharomyces. This need is now met by the publication of a three-volume series to serve as the authoritative sequel. The first volume focuses on the genome organization of the yeast Saccharomyces as well as protein translation and its regulation and energy metabolism. Subsequent volumes emphasize such topics as the cell cycle, secretion, and transcription. Together, these volumes provide a comprehensive survey of the molecular and cellular biology of Saccharomyces and Schizosaccharomyces, serving not only as a current summary of every significant area of investigation, but also as a thorough reference source. These volumes are required reading for everyone in the field and anyone curious about the state of the art of molecular and cellular biology.

Written by a team of best-selling authors, BIOLOGY: THE UNITY AND DIVERSITY OF LIFE, 14th Edition reveals the biological world in wondrous detail. Packed with eye-catching photos and images, this text shows and tells the fascinating story of life on Earth, and engages readers with hands-on activities that encourage critical thinking. Chapter opening Learning Roadmaps help you focus on the topics that matter most and section-ending Take Home Messages reinforce key concepts. Helpful in-text features include a running glossary, case studies, issue-related essays, linked concepts, self-test questions, data analysis problems, and more. Known for a clear, accessible style, BIOLOGY: THE UNITY AND DIVERSITY OF LIFE, 14th Edition puts the living world of biology under a microscope for readers from all walks of life to analyze, understand, and enjoy! Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

The classic personal account of Watson and Crick’s groundbreaking discovery of the structure of DNA, now with an introduction by Sylvia Nasar, author of A Beautiful Mind. By identifying the structure of DNA, the molecule of life, Francis Crick and James Watson revolutionized biochemistry and won themselves a Nobel Prize. At the time, Watson was only twenty-four, a young scientist hungry to make his mark. His uncompromisingly honest account of the heady days of their thrilling sprint against other world-class researchers to solve one of science’s greatest mysteries gives a dazzlingly clear picture of a world of brilliant scientists with great gifts, very human ambitions, and bitter rivalries. With humility unspoiled by false modesty, Watson relates his and Crick’s desperate efforts to beat Linus Pauling to the Holy Grail of life sciences, the identification of the basic building block of life. Never has a scientist been so truthful in capturing in words the flavor of his work.

The much-anticipated 3rd edition of Cell Biology delivers comprehensive, clearly written, and richly illustrated content to today’s students, all in a user-friendly format. Relevant to both research and clinical practice, this rich resource covers key principles of cellular function and uses them to explain how molecular defects lead to cellular dysfunction and cause human disease. Concise text and visually amazing graphics simplify complex information and help readers make the most of their study time. Clearly written format incorporates rich illustrations, diagrams, and charts. Uses real examples to illustrate key cell biology concepts. Includes beneficial cell physiology coverage. Clinically oriented text relates cell biology to pathophysiology and medicine. Takes a mechanistic approach to molecular processes. Major new didactic chapter flow leads with the latest on genome organization, gene expression and RNA processing. Boasts exciting new content including the evolutionary origin of eukaryotes, super resolution fluorescence microscopy, cryo-electron microscopy, gene editing by CRISPR/Cas9, contributions of high throughput DNA sequencing to understand genome organization and gene expression, microRNAs, IncRNAs, membrane-shaping proteins, organelle-organelle contact sites, microbiota, autophagy, ERAD, motor protein mechanisms, stem cells, and cell cycle regulation. Features specially expanded coverage of genome sequencing and regulation, endocytosis, cancer genomics, the cytoskeleton, DNA damage response, necroptosis, and RNA processing. Includes hundreds of new and updated diagrams and micrographs, plus fifty new protein and RNA structures to explain molecular mechanisms in unprecedented detail.

Biology for AP® courses covers the scope and sequence requirements of a typical two-semester Advanced Placement® biology course. The text provides comprehensive coverage of foundational research and core biology concepts through an evolutionary lens. Biology for AP® Courses was designed to meet and exceed the requirements of the College Board’s AP® Biology framework while allowing significant flexibility for instructors. Each section of the book includes an introduction based on the AP® curriculum and includes rich features that engage students in scientific practice and AP® test preparation; it also highlights careers and research opportunities in biological sciences.

Cell biology discusses the structure and composition cells. DNA damage and replication, cell division and the cell cycle are some of the significant aspects studied under this field. It involves a microscopic as well as molecular study of both prokaryotic and eukaryotic cells. It is an important field which facilitates advancements of related branches like biochemistry, evolution, genetics, nanotechnology, etc. This book

explores all the important aspects of cell biology in the present day scenario. It will serve as a valuable source of reference for graduate and post-graduate students.

Chromosome Structures: Advances in Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Chromosome Structures. The editors have built Chromosome Structures: Advances in Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Chromosome Structures in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Chromosome Structures: Advances in Research and Application: 2011 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 http://www.ScholarlyEditions.com/.

Bioinformatics, which can be defined as the application of computer science and information technology to the field of biology and medicine, has been rapidly developing over the past few decades. It generates new knowledge as well as the computational tools to create that knowledge. Understanding the basic processes in living organisms is therefore indispensable for bioinformaticians. This book addresses beginners in molecular biology, especially computer scientists who would like to work as bioinformaticians. It presents basic processes in living organisms in a condensed manner. Additionally, principles of several high-throughput technologies in molecular biology, which need the assistance of bioinformaticians, are explained from a biological point of view. It is structured in the following 9 chapters: cells and viruses; protein structure and function; nucleic acids; DNA replication, mutations, and repair; transcription and posttranscriptional processes; synthesis and posttranslational modifications of proteins; cell division; cell signaling pathways; and high-throughput technologies in molecular biology.

The fundamentals of biology beam its searchlight on all the basic principles contained in various aspects of life sciences, like recombinant DNA, genetics, molecular biology and biochemistry. Via the in-depth study of these principles, humans can adequately understand all the basic mechanisms that life entails and then find an anchor for his biological thinking and knowledge, which are all required for full understanding of the various challenges humans encounter in day-to-day lives. These challenges vary from problems with human environmental quality, loss of biodiversity, diseases, and health. The basic chemical structures of living things relate a great deal to their physical structure. Various cell processes come to play also to give the human being its structure and function as seen on the exterior. Cellular organizations are equally essential, ensuring one cell functions in its place without unwanted interference with another cell and its function. Living processes depend heavily on various metabolic processes, and these processes occur in animals and plants. Humans, being the chief among higher animals, remain the main focus and end point of all biological studies.

Schaum's Outlines present all the essential course information in an easy-to-follow, topic-by-topic format. You also get hundreds of examples, solved problems, and practice exercises to test your skills.

Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand.We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts.

Nuclear Structure and Gene Expression assimilates the contributions of genome organization and of the components of the nuclear matrix to the control of DNA and RNA synthesis. Nuclear domains which accommodate DNA replication and gene expression are considered in relation to short-term developmental and homeostatic requirements as well as to long-term commitments to phenotypic gene expression in differentiated cells. Consideration is given to the involvement of nuclear structure in gene localization as well as to the targeting and concentration of transcription factors. Aberrations in nuclear architecture associated with and potentially functionally related to pathologies are evaluated. Tumor cells are described from the perspective of the striking modifications in both the composition and organization of nuclear components. Nuclear Structure and Gene Expression presents concepts as well as experimental approaches, which define functionality of nuclear morphology. * Mechanisms of interaction between nuclear structure and genes * Gene expression regulation by elements of the nuclear matrix * How nuclear structure exerts a regulatory effect on other aspects of cell function/physiology

Since the discovery of the DNA structure researchers have been highly interested in the molecular basis of genome inheritance. This book covers a wide range of aspects and issues related to the field of DNA replication. The association between genome replication, repair and recombination is also addressed, as well as summaries of recent work of the replication cycles of prokaryotic and eukaryotic viruses. The reader will gain an overview of our current understanding of DNA replication and related cellular processes, and useful resources for further reading.

Fundamentals of Molecular Structural Biology reviews the mathematical and physical foundations of molecular structural biology. Based on these fundamental concepts, it then describes molecular structure and explains basic genetic mechanisms. Given the increasingly interdisciplinary nature of research, early career researchers and those shifting into an adjacent field often require a "fundamentals" book to get them up-to-speed on the foundations of a particular field. This book fills that niche. Provides a current and easily digestible resource on molecular structural biology, discussing both foundations and the latest advances Addresses critical issues surrounding macromolecular structures, such as structure-based drug discovery, single-particle analysis, computational molecular biology/molecular dynamic simulation, cell signaling and immune response, macromolecular assemblies, and systems biology Presents discussions that ultimately lead the reader toward a more detailed understanding of the basis and origin of disease

This is a second edition of DNA Replication in Eukaryotic Cells, published in 1996. This up-to-date monograph provides a broad account of DNA replication and related functions such as DNA repair and protein phosphorylation, as well as a review of recent advances in understanding the complex gene and protein interactions that underpin this essential cellular function. The new edition not only summarizes the many advances in our understanding of DNA replication in eukaryotic cells that have occurred during the past decade, but also will stimulate thinking about the relationships between DNA replication, human disease, and targeted therapeutics.

Advances in Cell Biology has been initiated as a continuing, multi-volume series to report on the progress of a wide spectrum of

problems of cell structure and cell function. Jn arranging these volumes individual contributors are asked not only to review the major new information, but especially to present the state of a given problem or area by discussing the current central issues, speculations, concepts, hypotheses, and technical problems. We intend, in addition, that these volumes will not be concerned with comprehensive reviews of the recent literature but will consist rather of presentations of an interpretive and integrative nature, based on selection of major research advances. It is our aim that these volumes should provide the means whereby cell biologists may keep themselves reasonably well informed about the current progress in research areas in cell biology in which they are not immediately or directly involved themselves. The articles, nevertheless, are expected to bring into focus the experimental objectives of the specialists in a given research area. D. M.P. L. G. E.M. vii Contents Contributors v Preface vii 1 1. The Regulation of DNA Synthesis in Eukaryotes James Douglas Watson 2. D·RNA Containing Ribonucleoprotein Particles and Messenger RNA Transport 47 G. P. Georgiev and 0. P. Samarina Recent Developments in the Synchronization of 3. Tetrahymena Cell Cycle 111 Eric Zeuthen 153 4. Repetitious DNA Christopher Bostock 5. Mitosis 225 R. Bruce Nicklas Specific Enzyme Production in Eukaryotic Cells 299 6.

Viruses interact with host cells in ways that uniquely reveal a great deal about general aspects of molecular and cellular structure and function. Molecular and Cellular Biology of Viruses leads students on an exploration of viruses by supporting engaging and interactive learning. All the major classes of viruses are covered, with separate chapters for their replication and expression strategies, and chapters for mechanisms such as attachment that are independent of the virus genome type. Specific cases drawn from primary literature foster student engagement. End-of-chapter questions focus on analysis and interpretation with answers being given on the website (half for students, all for instructors). Examples come from the most-studied and medically important viruses such as HIV, influenza, and poliovirus. Plant viruses and bacteriophages are also included. There are chapters on the overall effect of viral infection on the host cell. Coverage of the immune system is focused on the interplay between host defenses and viruses, with a separate chapter on medical applications such as anti-viral drugs and vaccine development. The final chapter is on virus diversity and evolution, incorporating contemporary insights from metagenomic research. Key selling feature: Readable but rigorous coverage of the molecular and cellular biology of viruses Molecular mechanisms of all major groups, including plant viruses and bacteriophages, illustrated by example Host-pathogen interactions at the cellular and molecular level emphasized throughout Medical implications and consequences included Quality illustrations available to instructors Extensive questions and answers for each chapter

Essential Cell Biology provides a readily accessible introduction to the central concepts of cell biology, and its lively, clear writing and exceptional illustrations make it the ideal textbook for a first course in both cell and molecular biology. The text and figures are easy-to-follow, accurate, clear, and engaging for the introductory student. Molecular detail has been kept to a minimum in order to provide the reader with a cohesive conceptual framework for the basic science that underlies our current understanding of all of biology, including the biomedical sciences. The Fourth Edition has been thoroughly revised, and covers the latest developments in this fast-moving field, yet retains the academic level and length of the previous edition. The book is accompanied by a rich package of online student and instructor resources, including over 130 narrated movies, an expanded and updated Question Bank. Essential Cell Biology, Fourth Edition is additionally supported by the Garland Science Learning System. This homework platform is designed to evaluate and improve student performance and allows instructors to select assignments on specific topics and review the performance of the entire class, as well as individual students, via the instructor dashboard. Students receive immediate feedback on their mastery of the topics, and will be better prepared for lectures and classroom discussions. The user-friendly system provides a convenient way to engage students while assessing progress. Performance data can be used to tailor classroom discussion, activities, and lectures to address students' needs precisely and efficiently. For more information and sample material, visit http://garlandscience.rocketmix.com/.

Cell Biology of Physarum and Didymium, Volume I: Organisms, Nucleus, and Cell Cycle presents important experimental research on Physarum and Didymium for developmental and cellular studies. This book is organized into four parts, encompassing 12 chapters that summarize the taxonomy, biological activities, genetics, and cell cycle of these organisms. The opening part covers two chapters on morphology, taxonomy, phylogeny, biosystematics, and evolutionary implications of Physarum and Didymium species. This is followed by discussions on the biological aspects of these species. These include periodic events of the mitotic cycle in Physarum polycephalum. The general characteristics of chemoreception at the membrane level using plasmodium as a model organism, as well as the structure and motility of plasmodium, are also included. The third part of the book focuses on genetic analysis of plasmodium development and the discovery of techniques for the genetic manipulation of P. polycephalum. Progress in the genetic analysis of other processes is summarized. The concluding part examines the morphological evolution of the nucleus during the mitotic cycle together with the results from ultracytochemical and radioautographic studies. It also includes a discussion on DNA organization and replication in P. polycephalum. Finally, the synthesis and degradation of RNA in Physarum and the relationship of these biochemical processes to mitotic cycle and differentiation are tackled in the concluding chapter. The book will serve as a frequent, single reference source to brief cell biologists on the primary research on Physarum and Didymium. It will be a good source for graduate students in cell biology, and perhaps in other graduate courses.

A Top 25 CHOICE 2016 Title, and recipient of the CHOICE Outstanding Academic Title (OAT) Award. How much energy is released in ATP hydrolysis? How many mRNAs are in a cell? How genetically similar are two random people? What is faster, transcription or translation?Cell Biology by the Numbers explores these questions and dozens of others provid

of energids per cell is assumed to equal the number of genetic complements as well as the number of viable cells that eventually may emerge from it without replication of its genetic material. (In eucaryotic cells, polyenergidy occurs in the form of cells containing several nuclei each or as polyploidy, referring to the co-existence of genollles within the boundaries of a single nucleus. Obviously terms such as "poly nucleated" and "polyploid" arc inappropriate for protocaryotic cells.) The number of energids pCI' cell can be subject to variation as a response to certain environmental conditions 01' during certain phases of a developmental cycle. The absence in protocaryotic nuclear bodies of structural components other than DNA markedly affects their structure and morphology. Since the protocaryon essentially is an accumulation of DNA, the amount, mo lecular organization and chemical state of the DNA are basic determinants of nuclear shape and fine structure. Therefore, the organized DNA molecule (the genophor) must be considered the principal subject of any treatise dealing with nuclear cytology in bacteria and Cyanophyceae. Chromosomes have structure, determined by the interactions of proteins with DNA, and chromosomes have functions, in particular, replication of DNA and transcription of messenger RNA. Chromosome structure and function are not separate topics,

since chromosome organization pro foundly influences the activity of the genome in replication and transcrip tion. This is especially clear for higher cells, including human cells, in which chromatin fibers are created by the binding of histone proteins to the DNA, and folding of the fibers produces mitotic chromosomes and interphase nuclei. The intricate organization of DNA in higher cells is now recognized as being closely involved with genome activity. Many fundamental results have originated from studies of bacterial and viral systems, which have been systems of choice because of their less complex life cycles. The processes of replication and transcription show differences between the higher and simpler systems (e. g. , different enzymes and protein factors are involved). But the parallels are as striking as the differences in detail. Even for bacteria and viruses, a full understanding of these processes will require integrating the results of molecular biology with those of structural biology and cell biology. Three important subjects are covered in this volume: DNA replication and recombination, gene transcription, and chromosome organization. The sections dealing with replication and transcription examine recent results obtained by applying the techniques of molecular biology and biochemistry. Eukaryotic, prokaryotic, and viral systems are discussed.

Bacterial Physiology was inaugurated as a discipline by the seminal research of Maaløe, Schaechter and Kjeldgaard published in 1958. Their work clarified the relationship between cell composition and growth rate and led to unravel the temporal coupling between chromosome replication and the subsequent cell division by Helmstetter et al. a decade later. Now, after half a century this field has become a major research direction that attracts interest of many scientists from different disciplines. The outstanding question how the most basic cellular processes - mass growth, chromosome replication and cell division - are inter-coordinated in both space and time is still unresolved at the molecular level. Several particularly pertinent questions that are intensively studied follow: (a) what is the primary signal to place the Z-ring precisely between the two replicating and segregating nucleoids? (b) Is this coupling related to the structure and position of the nucleoid itself? (c) How does a bacterium determine and maintain its shape and dimensions? Possible answers include gene expression-based mechanisms, self-organization of protein assemblies and physical principles such as micro-phase separations by excluded volume interactions, diffusion ratchets and membrane stress or curvature. The relationships between biochemical reactions and physical forces are yet to be conceived and discovered. This e-book discusses the above mentioned and related questions. The book also serves as an important depository for state-of-the-art technologies, methods, theoretical simulations and innovative ideas and hypotheses for future testing. Integrating the information gained from various angles will likely help decipher how a relatively simple cell such as a bacterium incorporates its multitude of pathways and processes into a highly efficient self-organized system. The knowledge may be helpful in the ambition to artificially reconstruct a simple living system and to develop new antibacterial drugs.

Introduction to the study of cell biology; The organization of living systems; The structure of proteins; Energy, enzymes, and metabolism; Membrane structure and function; The cell surface; Cytoplasmic menbrane systems; Mitochondria and the conservation of chemical energy; Photowynthesis and the chloroplast; The nature of the gene; The flow of information through the cell; Gene expression in eukaryotic cells; The control of gene expression; Cell growth and replication; Microtubules, microfilaments, and cell division; Contractility and cell movement; Cytoplasmic genes and their expression; The immune system; Cancer and aging.

This book addresses the innovative themes in characterizing the cellular membrane platforms and intracellular networking, as well as the architectural aspects of cell compartments mediated by the entry and replication cycles of viruses. The instrumentation of modern molecular and cellular biology provides a potent array of wave packets to image, detect and manipulate major dynamics of macromolecular and subviral assemblies as in the host cellular context.The book includes case studies presented with highly coherent and structured illuminations, including microscopy, spectroscopy and scanning probes. The compilation and integration of the methodology provides time-resolved observations on the reactivity of structures from near-atomic resolution to various molecular or cellular levels of descriptors. The book provides a broad introduction to the various fascinating virus systems and may be used as an advanced textbook by graduate students in biomedicine. It provides adequate background material to explore further the research problems of epidemics in the 21st century.

In this lecture, we will briefly review the principles of physics, central metabolism, and cell biology that make health possible. This exercise is appropriate for those of us who have set before ourselves the problem of understanding and preserving life processes, because it is through the medium of a cell that energy creates life. We are aware that life processes require a complex set of biochemical reactions. But that is not enough. Not only are complex reactions necessary, but superimposed on this essential requirement is the necessity to build and maintain a dynamic cellular structure. Chemical energy builds cells. In this lecture, we will see how cells extract energy from the entropic dissolution of the universe, how the extracted energy is used to build cell structure, and how cell structure determines cell function. Table of Contents: Origin and Energy of Life / How Cells Make a Living / Order From Chaos: Entropy and The River of Time / Capturing Entropy / Cell Architecture / Why Cells are Compartmentalized. The Function of Organelles / Cell Function / The Secretory Pathway / The Golgi Apparatus / Mitochondria / The Cytoskeleton: How Organelles are Organized / Vesicle Transport / Mitosis / Energy and Metabolism / References

Bacillus subtilis is one of the best understood prokaryotes in terms of molecular biology and cell biology. Its superb genetic amenability and relatively large size have provided powerful tools to investigate a bacterium in all possible aspects. Recent improvements in technology have provided novel and amazing insights into the dynamic structure of this single cell organism. The organism is a model for differentiation, gene/protein regulation, and cell cycle events in bacteria. This book presents an overview of the most recent exciting new research fields and provides a picture of the major cytological aspects of a model bacterium. The authors present the most recent knowledge on topics, such as the replication and segregation of the chromosome, cell division, replication and growth, the cell cycle, transcription, translation, regulation, the actin cyctoskeleton, the cell membrane and cell wall, biofilm formation, and sporulation. Also covered are DNA repair, the regulation of transcription through RNA molecules, and the regulation of protein activity through proteolysis. The authors seamlessly merge the fields of bacterial cell biology and molecular biology to provide an integral view of the bacterial cell, providing an understanding of the way a bacterial cell functions as a whole entity and in 3D, i.e. how it is spatially organized, and even how bacterial cells communicate with each other, or give their life for the sake of the whole community. This is an essential book for anyone interested in Bacillus, cell biology, bacterial genetics, and molecular biology.

Viruses are major pathogens in humans, and in the organisms with which we share this planet. The massive health and economic burden these agents impose has spurred a huge research effort to understand their most intimate details. One outcome of this effort has been the production, in many but certainly not all cases, of effective vaccines and therapies. - other consequence has been the realization that we can exploit viruses and put them to work on our behalf. Viruses are still seen to have the most - tential as vehicles for gene delivery and other therapeutic applications. However, their ability to exploit cellular functions to their own ends makes viruses not only highly effective pathogens but also exquisite experimental tools. Work with viruses underpins much of our current understanding of molecular cell biology and related fields. For membrane traffic in parti- lar, viruses have been crucial in providing insights into key cellular fu- tions and the molecular mechanisms underlying these events.

Cell Biology, A Comprehensive Treatise, Volume 2: The Structure and Replication of Genetic Material is mainly about the structure and replication of genetic material in both the nucleus and cytoplasmic organelles. This volume is part of the first four volumes that establish a firm

foundation regarding issues of cell structure and function. These issues include cell reproduction, differentiation, and cell-to-cell interactions. This book is divided into nine chapters. Each chapter deals extensively with chromosomes – its physical, genetic, and chemical structures. In addition, this book explains the replication of chromosomes in terms of the cell cycle, as well as their coding capacity. It also discusses the functional organization (structure and levels) of the chromosomes. The concluding chapters present the DNA replication molecular principles and enzymatic machinery. Furthermore, this book explains DNA repair and its relationship to various biological endpoints. The authors of this book reasonably explain and emphasize already established facts and concepts in terms that are relatively easy to understand. Undergraduate and graduate students, teachers, researchers, scientists, and others interested or in need of information regarding cell biology will find this book of great use.