

Biology Form 4 Chapter 2 Mind Map Notes

Chapter 1. Bioinorganic Chemistry of Nitric Oxide and S-Nitrosothiols The interplay of nitric oxide (NO), biological thiols, and metals has been a topic of intense study since the discovery of NO as the endothelium-derived relaxation factor. NO is a redox-active diatomic, radical gas that is generated biologically during the conversion of L-arginine to L-citrulline by nitric oxide synthases (NOS), NADH, and O₂. NOS enzymes have ironporphyrin and biopterin cofactors that catalyze this conversion. S-nitrosothiols form in biology as NO-transport mechanisms, post-translational modifications, or as a cellular protectant against overexposure to NO. Heme and non-heme iron cofactors serve as targets in biology to induce degradation of active sites or to induce conformational changes to inhibit or promote cellular pathways. The only structurally characterized metal complexes containing S-nitrosothiols have either iridium or ruthenium centers.

Chapter 2. Rapid Nitric Oxide and Nitrogen Dioxide Detection and Quantification Assays and Devices based on M(BIPhMe)₂ Complexes To explore the release of nitrogen oxide gases from reaction solutions, we developed a series of colorimetric sensors based on the cis-nitrogen donating ligand BIPhMe, bis-(1-methylimidazol-2-yl)phenylmethoxymethane. The complexes M(BIPhMe)₂, where M is Fe²⁺ or Co²⁺ and X is Cl⁻, Br, or I, were prepared, and structurally and spectroscopically characterized. The reactivity of these complexes toward NO (g) and NO₂ (g) in solution was explored and characterized. These complexes were then incorporated into test strips and syringes to provide devices that can qualitatively, and in the case of the syringes quantitatively, detect NO(g) and NO₂(g) in a reaction headspace without additional equipment.

Chapter 3. Reactions of (PPN)(SNO) and (PPN)(SSNO) with HBF₄ and Biomimetic Iron Complexes. The biological relevance of HSNO as a transnitrosating was recently reported. The gas H₂S can perform an H⁺-NO⁺ exchange with an S-nitrosated serum albumin to form HSNO, which can cross the cellular membrane and transnitrosate an exposed cysteine on a hemoglobin protein. With this discovery, we explored the reactivity of the anion SNO⁻ and the related SSNO⁻ toward an acid and the biomimetic iron complexes [FeIII(TPP)Cl], [Fe₂S₂(SPh)₄]²⁻, [Fe₂(Et-HPTB)(PhCO₂)₂]²⁺, [Fe₂([μ]-OH)(Ph₄DBA)(TMEDA)₂(OTf)], and [Fe(BIPhMe)Cl₂]. In all cases HSNO was found to be unstable. The reaction of SNO with HBF₄ led to NO (g) release. The reaction of both S-nitrosothiols with [FeIII(TPP)Cl] resulted in reductive nitrosylation of the iron center. The reaction of the [2Fe-2S] cluster with both S-nitrosothiols led to the formation of reduced Roussin's black anion. The reaction of the mononuclear complex [Fe(BLPhMe)Cl₂] with both S-nitrosothiols led to formation of the dinitrosyl iron complex [FeS₅(NO)₂]⁻. Only with the two diiron complexes was a difference in reactivity between SNO and SSNO⁻ observed, leading to formation of Roussin's black anion or [FeS₅(NO)₂]⁻, respectively.

Chapter 4. Reactions of Nitrogen Oxide Species with a Monofunctional Platinum Complex The structural isomers SNO⁻ and NSO⁻ have both been synthetically prepared, but only the metal-binding reactivity of NSO has been previously explored. Structural characterization of early first-row, and second and third row transition metals are reported with NSO⁻, where metal-binding occurs via the terminal nitrogen atom. We attempted to form structurally characterizable Pt-SNO and Pt-SSNO complexes using the "monofunctional" complex cis-[Pt(NH₃)₂(py)Cl](OTf), but were not successful. Instead, a new complex formed that we propose to be a polysulfide-bridged diplatinum complex with intact nitrogen-binding of the starting complex and release of NO (g). The vibrational spectra of the proposed complexes were calculated using DFT methods to compare with the experimental data and provides further evidence for the formation of a polysulfide-bridged diplatinum complex. DFT calculations were also performed on possible structural isomers of Pt-SNO and Pt-SSNO complexes. To test whether that the reactivity may not occur by release of NO⁺ from the S-nitrosothiols, cis-[Pt(NH₃)₂(py)Cl](OTf) was found to react with NOBF₄ to form cis-[Pt(NH₃)₂(py)(CH₃CN)]₂⁺ and cis-mer-[Pt(NH₃)₂(py)Cl₃]⁺.

Chapter 5. Synthesis of [3:1] Site-Differentiated [4Fe-4S] Clusters and their Reactivity towards NO (g) and Ph₃CSNO Previous studies provide evidence that [4Fe-4S] clusters serve as targets of reactive nitrogen oxide species in biology. The products of this reaction range from dinitrosyl iron complexes, [Fe(NO)₂L₂]⁻, to Roussin's Black Anion, [Fe₄S₃(NO)₇]. To date, the pathways by which these reactions occur have not been fully elucidated. In this study we prepared the site-differentiated complexes [Fe₄S₄(LS₃)L']₂ - (LS₃ = 1,3,5-tris(4,6-dimethyl-3-mercaptophenylthio)-2,4,6-tris(p-tolylthio)benzene; L' = Cl, SEt, SPh, N₃, 2-SPyr, Tp, S₂CNEt₂) to serve as synthetic models for biological [4Fe-4S] clusters and studied their reactivity toward NO (g) and Ph₃CSNO. The products were characterized by X-ray crystallography, mass spectrometry, and IR, EPR, and H NMR spectroscopy. In all cases reported here, the reactions proceed via formation of the S = V₂ species [Fe₄S₄(NO)₄], which ultimately converts to EPR-silent [Fe₄S₃(NO)₇].

Appendix A. M(BIPhMe) Complexes and Reactions with RNOS The synthesis and characterization of the metal-BIPhMe complexes [Fe(BIPhMe)I₂], [Fe(BIPhMe)(MeCN)₂(OTf)₂], [Fe₂([μ]-O)(BIPhMe)₂(NO₃)₄], [Cu(BIPhMe)₂(OTf)₂], [Cu(BIPhMe)₂][CuCl₂], and [Zn₂([μ]-OTf)₂(BIPhMe)₂(OTf)₂] was reported. These complexes were characterized by X-ray diffraction, FTIR, ¹H NMR, and ESI-MS. The reaction of [Zn₂([μ]-OTf)₂(BIPhMe)₂(OTf)₂] with (PPN)(SNO) results in the release of NO (g) and formation of (PPN)(SSNO) and a zinc-sulfide species. The reaction of (PPN)(SSNO) results in the release of NO (g) and a zinc-sulfide species.

Appendix B. Mass-Spec and FTIR figures of the Reactions of NO (g) and Ph₃CSNO with [Fe₄S₄(LS₃)L']₂-

A clear and straightforward explanation of genetics in this new edition of the popular 101 series. Our genetic makeup determines so much about who we are, and what we pass on to our children—from eye color, to height, to health, and even our longevity. Genetics 101 breaks down the science of how genes are inherited and passed from parents to offspring, what DNA is and how it works, how your DNA affects your health, and how you can use your personal genomics to find out more about who you are and where you come from. Whether you're looking for a better scientific understanding of genetics, or looking into your own DNA, Genetics 101 is your go-to source to discover more about both yourself and your ancestry.

Although its importance is not always recognized, theory is an integral part of all biological research. Biologists' theoretical and conceptual frameworks inform every step of their research, affecting what experiments they do, what techniques and technologies they develop and use, and how they interpret their data. By examining how theory can help biologists answer questions like "What are the engineering principles of life?" or "How do cells really work?" the report shows how theory synthesizes biological knowledge from the molecular level to the level of whole ecosystems. The book concludes that theory is already an inextricable thread running throughout the practice of biology; but that explicitly giving theory equal status with other components of biological research could help catalyze transformative research that will lead to creative, dynamic, and innovative advances in our understanding of life.

This book represents the most comprehensive and up-to-date collection of information on the topic of computational molecular biology.

Bringing the most recent research into the forefront of discussion, Algorithms in Computational Molecular Biology studies the most important and useful algorithms currently being used in the field, and provides related problems. It also succeeds where other titles have failed, in offering a wide range of information from the introductory fundamentals right up to the latest, most advanced levels of study.

Advanced Methods in Molecular Biology and Biotechnology: A Practical Lab Manual is a concise reference on common protocols and techniques for advanced molecular biology and biotechnology experimentation. Each chapter focuses on a different method, providing an overview before delving deeper into the procedure in a step-by-step approach. Techniques covered include genomic DNA extraction using cetyl trimethylammonium bromide (CTAB) and chloroform extraction, chromatographic techniques, ELISA, hybridization, gel electrophoresis, dot blot analysis and methods for studying polymerase chain reactions. Laboratory protocols and standard operating procedures for key equipment are also discussed, providing an instructive overview for lab work. This practical guide focuses on the latest advances and innovations in methods for molecular biology and biotechnology investigation, helping researchers and practitioners enhance and advance their own methodologies and take their work to the next level. Explores a wide range of advanced methods that can be applied by

researchers in molecular biology and biotechnology Features clear, step-by-step instruction for applying the techniques covered Offers an introduction to laboratory protocols and recommendations for best practice when conducting experimental work, including standard operating procedures for key equipment

Biology of Oysters offers scientific insights into the structure and function of oysters. Written by an expert in the field of shellfish research, this book presents more than 50 years of empirical research literature. It provides an understanding of the edible oysters, in order to equip students and researchers with the background needed to undertake further investigations on this model marine invertebrate. Presents empirical research findings in context with the relevant theory and its expression in computer models Includes information on studies of other bivalve species such as mussels and clams Offers a description of the whole organism to provide a frame of reference for further research Includes research developments in the phylogeny, physiology and ecology of oysters

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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

Molecular Biology of B Cells, Second Edition is a comprehensive reference to how B cells are generated, selected, activated and engaged in antibody production. All of these developmental and stimulatory processes are described in molecular, immunological, and genetic terms to give a clear understanding of complex phenotypes. Molecular Biology of B Cells, Second Edition offers an integrated view of all aspects of B cells to produce a normal immune response as a constant, and the molecular basis of numerous diseases due to B cell abnormality. The new edition continues its success with updated research on microRNAs in B cell development and immunity, new developments in understanding lymphoma biology, and therapeutic targeting of B cells for clinical application. With updated research and continued comprehensive coverage of all aspects of B cell biology, Molecular Biology of B Cells, Second Edition is the definitive resource, vital for researchers across molecular biology, immunology and genetics. Covers signaling mechanisms regulating B cell differentiation Provides information on the development of therapeutics using monoclonal antibodies and clinical application of Ab Contains studies on B cell tumors from various stages of B lymphocytes Offers an integrated view of all aspects of B cells to produce a normal immune response

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Investigations in space have led to fundamental discoveries of the human body to the space environment. Gilles Clément has conducted extensive research in this field. This readable text presents the findings from the life science experiments conducted

during and after space missions. About 1200 human space flights have been completed to date, including more than 500 astronauts from various countries, for a combined total presence in space of about 90 years. The first edition of this title was published in 2005 (written in 2003 – 2004), and new data is now available from crewmembers participating in long-duration flights on board the International Space Station (ISS). The number of astronauts who have spent six months in orbit has doubled since 2004. On board the ISS, the astronauts use newly developed pharmaceutical countermeasure for bone loss (such as bisphosphonates) and state-of-the-art exercise resistive devices against muscle atrophy and cardiovascular deterioration. The ISS life support systems now use advanced closed-loop systems for meeting the needs of a 6-person crew, including recycling urine to water. Some of these new technologies have potential spin-offs for medical (i.e., sedentary life style, obesity) and environmental issues here on Earth. And finally, there are new space research opportunities with the Orion space vehicle that will soon replace the Space Shuttle, the Moon, and Mars space exploration program that is slowly but surely taking shape, and the space tourism sector that has become a reality. The focus on this edition is the ISS, Orion and planetary exploration, and space tourism. This edition also includes more than 20% new material, along with photographs, data, and video clips for Springer Extras!

Historically, structural biology and virology have been separate disciplines, with the field of virology developing around particular virus families. However, recent advances in the techniques of structural biology, including high-performance computing and graphics visualization, X-ray crystallography, and electron microscopy, coupled with continued progress in molecular biology and virology have caused a major convergence of interests. Structural virology now provides some of the most outstanding examples of structure-function relationships in biology. Viruses encounter many common problems in their life cycles, and so the solutions that they have evolved provide instructive contrasts between different biological strategies for survival. These ideas are illustrated by each of the different chapters, most of which cover a viral system that well illustrates a particular biological function. The goal of this book is to unite the structural and biological aspects of virus function. With this in mind, each chapter has been written explicitly by experts to address a broad audience ranging from graduate students to researchers in structural biology, virology, molecular biology, and biochemistry.

In the ten-year interval since the first edition of this volume went to press, our knowledge of extracellular matrix (ECM) function and structure has enormously increased. Extracellular matrix and cell-matrix interaction are now routine topics in the meetings and annual reviews sponsored by cell biology societies. Research in molecular biology has so advanced the number of known matrix molecules and the topic of gene structure and regulation that we wondered how best to incorporate the new material. For example, we deliberated over the inclusion of chapters on molecular genetics. We decided that with judicious editing we could present the recent findings in molecular biology within the same cell biology framework that was used for the first edition, using three broad headings: what is extracellular matrix, how is it made, and what does it do for cells? Maintaining control over the review of literature on the subject of ECM was not always an easy task, but we felt it was essential to production of a highly readable volume, one compact enough to serve the student as an introduction and the investigator as a quick update on graduate the important recent discoveries. The first edition of this volume enjoyed con hope the reader finds this edition equally useful. siderable success; we D. Hay Elizabeth vii Contents Introductory Remarks 1 Elizabeth D. Hay PART I. WHAT IS EXTRACELLULAR MATRIX? Chapter 1 Collagen T. F. Linsenmayer 1. Introduction 7 2. The Collagen Molecule 8 2. 1. Triple-Helical Domain(s)

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. Goodman’s Medical Cell Biology, Fourth Edition, has been student tested and approved for decades. This updated edition of this essential textbook provides a concise focus on eukaryotic cell biology (with a discussion of the microbiome) as it relates to human and animal disease. This is accomplished by explaining general cell biology principles in the context of organ systems and disease. This new edition is richly illustrated in full color with both descriptive schematic diagrams and laboratory findings obtained in clinical studies. This is a classic reference for moving forward into advanced study. Includes five new chapters: Mitochondria and Disease, The Cell Biology of the Immune System, Stem Cells and Regenerative Medicine, Omics, Informatics, and Personalized Medicine, and The Microbiome and Disease Contains over 150 new illustrations, along with revised and updated illustrations Maintains the same vision as the prior editions, teaching cell biology in a medically relevant manner in a concise, focused textbook

Hydrogen Sulfide in Plant Biology: Past and Present includes 17 chapters, with topics from cross-talk and lateral root development under stress, to post-translational modifications and disease resistance. With emerging research on the different roles and applications of H₂S, this title compiles the latest advances of this key signaling molecule. The development of a plant requires complex signaling of various molecules like H₂S in order to achieve regulated and proper development, hence hydrogen sulfide (H₂S) has emerged as an important signaling molecule that regulates nearly each and every stage of a plant’s lifecycle. Edited by leading experts in the field, this is a must-read for scientists and researchers interested in plant physiology, biochemistry and ecology. Discusses the emerging roles of H₂S in plant biology Presents the latest research from leading laboratories across the globe Edited by a team of experts in plant signaling

The major new course text has been written by experienced authors to provide coverage of the Advanced Subsidiary (AS) and Advanced GCE Biology and Human Biology specifications in a single book. Advanced Biology provides clear, well-illustrated information, which will help develop a full understanding of biological structure and function and of relevant applications. The topics have been carefully organised into parts, which give a logical sequence to the book. This new text has been developed to replace the best-selling titles Biology: Principles and Processes and Biology, A Functional Approach. Features include: full-colour design with clear diagrams and photographs; up-to-date information on biotechnology, health, applied genetics and ecology; clearly written text using the latest Institute of Biology terminology; a useful summary and a bank of practice questions at the end of every chapter; support boxes help bridge the gap from GCSE or equivalent courses; extension boxes providing additional depth of content - some by guest authors who are experts in their field; and a comprehensive index so you can quickly locate information with ease. There is also a website providing additional support that you can access directly at www.advancedbiology.co.uk.

NOTE: This loose-leaf, three-hole punched version of the textbook gives you the flexibility to take only what you need to class and add your own notes -- all at an affordable price. For loose-leaf editions that include MyLab(tm) or Mastering(tm), several versions may exist for each title and registrations are not transferable. You may need a Course ID, provided by your instructor, to register for and use MyLab or Mastering products. For introductory biology course for science majors Focus. Practice. Engage. Built unit-by-unit, Campbell Biology in Focus achieves

a balance between breadth and depth of concepts to move students away from memorization. Streamlined content enables students to prioritize essential biology content, concepts, and scientific skills that are needed to develop conceptual understanding and an ability to apply their knowledge in future courses. Every unit takes an approach to streamlining the material to best fit the needs of instructors and students, based on reviews of over 1,000 syllabi from across the country, surveys, curriculum initiatives, reviews, discussions with hundreds of biology professors, and the Vision and Change in Undergraduate Biology Education report. Maintaining the Campbell hallmark standards of accuracy, clarity, and pedagogical innovation, the 3rd Edition builds on this foundation to help students make connections across chapters, interpret real data, and synthesize their knowledge. The new edition integrates new, key scientific findings throughout and offers more than 450 videos and animations in Mastering Biology and embedded in the new Pearson eText to help students actively learn, retain tough course concepts, and successfully engage with their studies and assessments. Also available with Mastering Biology By combining trusted author content with digital tools and a flexible platform, Mastering personalizes the learning experience and improves results for each student. Integrate dynamic content and tools with Mastering Biology and enable students to practice, build skills, and apply their knowledge. Built for, and directly tied to the text, Mastering Biology enables an extension of learning, allowing students a platform to practice, learn, and apply outside of the classroom. Note: You are purchasing a standalone product; Mastering Biology does not come packaged with this content. Students, if interested in purchasing this title with Mastering Biology ask your instructor for the correct package ISBN and Course ID.

Instructors, contact your Pearson representative for more information. If you would like to purchase both the loose-leaf version of the text and Mastering Biology search for: 0134988361 / 9780134988368 Campbell Biology in Focus, Loose-Leaf Plus Mastering Biology with Pearson eText -- Access Card Package Package consists of: 013489572X / 9780134895727 Campbell Biology in Focus, Loose-Leaf Edition 013487451X / 9780134874517 Mastering Biology with Pearson eText -- ValuePack Access Card -- for Campbell Biology in Focus

This new volume of Methods in Cell Biology looks at receptor-receptor interactions, with sections on allosteric and effector interactions, crystallization and modeling, measuring receptor-receptor interactions and oligomerization in individual classes. With cutting-edge material, this comprehensive collection is intended to guide researchers of receptor-receptor interactions for years to come. Covers sections on allosteric and effector interactions, crystallization and modeling, measuring receptor-receptor interactions and oligomerization in individual classes Chapters are written by experts in the field Cutting-edge material

Designed as a text based on the mandatory course introduced by AICTE for all branches of B.Tech., the book mainly deals with the fundamental concepts of biology and their applications in engineering and technology. The clear and concise text will prove to be of immense value to the students and will help them to comprehend the subject. Also, the faculties will find it a highly useful resource for classroom teaching. KEY FEATURES • Easy to understand, learn and memorize. • Illustrations for better comprehension of the concepts. • The subject matter is discussed in an engaging style to induce students' interest. • Critical thinking questions to help enhance analytical and interpretational potential of the students. • Chapter-end questions for self-assessment and self-evaluation. • A large number of MCQs are provided online for practice and self-assessment. Visit:https://www.phindia.com/biology_for_engineers_chakraborty TARGET AUDIENCE • B.Tech. All disciplines (First Year Course)

Effective science teaching requires creativity, imagination, and innovation. In light of concerns about American science literacy, scientists and educators have struggled to teach this discipline more effectively. Science Teaching Reconsidered provides undergraduate science educators with a path to understanding students, accommodating their individual differences, and helping them grasp the methods--and the wonder--of science. What impact does teaching style have? How do I plan a course curriculum? How do I make lectures, classes, and laboratories more effective? How can I tell what students are thinking? Why don't they understand? This handbook provides productive approaches to these and other questions. Written by scientists who are also educators, the handbook offers suggestions for having a greater impact in the classroom and provides resources for further research.

This new edition of a timeless classic demonstrates how the use of clear, rational thinking and logic can win any argument, however emotionally charged the topic in question. It describes the typical flaws of reasoning in argument and shows how language can be used to deceive - and how to avoid being deceived. It will show you how, by learning what is 'straight', rational language, and clear thought, you can disentangle emotionally charged rhetoric and hold your own in any argument or debate, no matter how challenging. Although written nearly 80 years ago, this book proves that certain principles remain timeless; it has shown many thousands over the decades how to cope with media spin and distorted reasoning - and now it will do the same for you.

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Sauropods, those huge plant-eating dinosaurs, possessed bodies that seem to defy every natural law. What were these creatures like as living animals and how could they reach such uniquely gigantic sizes? A dedicated group of researchers in Germany in disciplines ranging from engineering and materials science to animal nutrition and paleontology went in search of the answers to these questions. Biology of the Sauropod Dinosaurs reports on the latest results from this seemingly disparate group of research fields and integrates them into a coherent theory regarding sauropod gigantism. Covering nutrition, physiology, growth, and skeletal structure and body plans, this volume presents the most up-to-date knowledge about the biology of these enormous dinosaurs.

Diagnostic Molecular Biology describes the fundamentals of molecular biology in a clear, concise manner to aid in the comprehension of this complex subject. Each technique described in this book is explained within its conceptual framework to enhance understanding. The targeted approach covers the principles of molecular biology including the basic knowledge of nucleic acids, proteins, and genomes as well as the basic techniques and instrumentations that are often used in the field of molecular biology with detailed procedures and explanations. This book also covers the applications of the principles and techniques currently employed in the clinical laboratory. • Provides an understanding of which techniques are used in diagnosis at the molecular level • Explains the basic principles of molecular biology and their application in the clinical diagnosis of diseases • Places protocols in context with practical applications

Following in the successful footsteps of the "Anatomy" and the "Physiology Coloring Workbook", The Princeton Review introduces two new coloring workbooks to the line. Each book features 125 plates of computer-generated, state-of-the-art, precise, original artwork--perfect for students enrolled in allied health and nursing courses, psychology and neuroscience, and elementary biology and anthropology courses.

A reissue of a classic book -- corrected, edited, typeset, redrawn, and indexed for the Biological Physics Series. Intended for undergraduate courses in biophysics, biological physics, physiology, medical physics, and biomedical engineering, this is an introduction to statistical physics with examples and problems from the medical and biological sciences. Topics include the elements of the theory of probability, Poisson statistics, thermal equilibrium, entropy and free energy, and the second law of thermodynamics. It can be used as a supplement to standard introductory physics courses, and as a text for medical schools, medical physics courses, and biology departments. The three volumes combined present all the major topics in physics. These books are being reissued in response to frequent requests to satisfy the growing need among students and practitioners in the medical and biological sciences with a working knowledge of the physical sciences. The books are also in demand in physics departments either as supplements to traditional intro texts or as a main text for those departments offering courses with biological or medical physics orientation.

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.

Lung Epithelial Biology in the Pathogenesis of Pulmonary Disease provides a one-stop resource capturing developments in lung epithelial biology related to basic physiology, pathophysiology, and links to human disease. The book provides access to knowledge of molecular and cellular aspects of lung homeostasis and repair, including the molecular basis of lung epithelial intercellular communication and lung epithelial channels and transporters. Also included is coverage of lung epithelial biology as it relates to fluid balance, basic ion/fluid molecular processes, and human disease. Useful to physician and clinical scientists, the contents of this book compile the important and most current findings about the role of epithelial cells in lung disease. Medical and graduate students, postdoctoral and clinical fellows, as well as clinicians interested in the mechanistic basis for lung disease will benefit from the book's examination of principles of lung epithelium functions in physiological condition. Provides a single source of information on lung epithelial junctions and transporters Discusses of the role of the epithelium in lung homeostasis and disease Includes capsule summaries of main conclusions as well as highlights of future directions in the field Covers the mechanistic basis for lung disease for a range of audiences

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/>.

Conservation Biology for All provides cutting-edge but basic conservation science to a global readership. A series of authoritative chapters have been written by the top names in conservation biology with the principal aim of disseminating cutting-edge conservation knowledge as widely as possible. Important topics such as balancing conservation and human needs, climate change, conservation planning, designing and analyzing conservation research, ecosystem services, endangered species management, extinctions, fire, habitat loss, and invasive species are covered. Numerous textboxes describing additional relevant material or case studies are also included. The global biodiversity crisis is now unstoppable; what can be saved in the developing world will require an educated constituency in both the developing and developed world. Habitat loss is particularly acute in developing countries, which is of special concern because it tends to be these locations where the greatest species diversity and richest centres of endemism are to be found. Sadly, developing world conservation scientists have found it difficult to access an authoritative textbook, which is particularly ironic since it is these countries where the potential benefits of knowledge application are greatest. There is now an urgent need to educate the next generation of scientists in developing countries, so that they are in a better position to protect their natural resources.

The Biology of Stentor summarizes all that has been learned about the biology of a certain group of ciliate protozoa: the stentors. Topics covered range from form and function in Stentor to behavior, fine structure, growth and division, and reorganization. Regeneration is also discussed, along with polarity, metabolism, genetics, and primordium development. This volume is comprised of 20 chapters and begins with a characterization of Stentor, with emphasis on its particular advantages in addressing general problems of biology. The reader is then introduced to form and function in Stentor, particularly *S. coeruleus*. The following chapters focus on the behavior (food selection, swimming, response to light, etc.) of stentors and the fine points of structure in terms of which this behavior is to be explained and which demonstrate the highly complex and precise achievements of morphogenesis. The remaining chapters explore growth and division in Stentor as well as the course of reorganization and regeneration; development of the oral primordium and how it is activated and inhibited; rate of regeneration in relation to the polar axis; fusion masses of whole stentors; and reconstitution in disarranged stentors. Various species of Stentor are also described, together with the techniques used to study them. The final chapter deals with hypotheses concerning the morphogenesis of ciliates. This book will be of interest to students and practitioners of biology and physiology.

With clear, Comprehensive and compact notes, EXPRESS is the best revision aid to help you tackle your upcoming SPM examinations! Here's a peek into what Express has to offer you: Chapter outline and concept map for a quick chapter overview Complete experiments which are especially tailored according to PEKA requirements Quick check which has exam-styled questions for review and reinforcement Quick test (exam-oriented questions)for self-evaluation of the understanding of each chapter Tips to enlighten students on: Common mistakes made in the examination Important facts to remember

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