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When molecular biology and immunohistochemistry can solve the problem. Rossi ED(1), Martini M, Straccia P, Larocca LM, Fadda G. Author information: (1)Division of Anatomic Pathology and Histology, Università Cattolica del Sacro Cuore, Agostino Gemelli School of Medicine and Hospital, Largo Francesco Vito 1, Rome, Italy. esther.rossi@rm.unicatt.it

Most research in the life sciences involves a core set ofmolecular-based equipment and methods, for which there is noshortage of step-by-step protocols. Nonetheless, there remains anexceedingly high number of inquiries placed to commercial technicalsupport groups, especially regarding problems. Molecular Biology Problem Solver: A LaboratoryGuide asks the reader to consider crucial questions, suchas: Have you selected the most appropriate research strategy? Have you identified the issues critical to your successfulapplication of a technique? Are you familiar with the limitations of a giventechnique? When should common procedural rules of thumb not beapplied? What strategies could you apply to resolve a problem? A unique question-based format reviews common assumptions andlaboratory practices, with the aim of offering a firm understandingof how techniques and procedures work, as well as how to avoidproblems. Some major issues explored by the book's expertcontributors include: Working safely with biological samples and radioactivematerials DNA and RNA purification PCR Protein and nucleid acid hybridization Prokaryotic and eukaryotic expression systems Properly using and maintaining laboratory equipment

Each Problem Solver is an insightful and essential study and solution guide chock-full of clear, concise problem-solving gems. All your questions can be found in one convenient source from one of the most trusted names in reference solution guides. More useful, more practical, and more informative, these study aids are the best review books and textbook companions available. Nothing remotely as comprehensive or as helpful exists in their subject anywhere. Perfect for undergraduate and graduate studies. Here in this highly useful reference is the finest overview of biology currently available, with hundreds of biology problems that cover everything from the molecular basis of life to plants and invertebrates. Each problem is clearly solved with step-by-step detailed solutions. DETAILS - The PROBLEM SOLVERS are unique - the ultimate in study guides. - They are ideal for helping students cope with the toughest subjects. - They greatly simplify study and learning tasks. - They enable students to come to grips with difficult problems by showing them the way, step-by-step, toward solving problems. As a result, they save hours of frustration and time spent on groping for answers and understanding. - They cover material ranging from the elementary to the advanced in each subject. - They work exceptionally well with any text in its field. - PROBLEM SOLVERS are available in 41 subjects. - Each PROBLEM SOLVER is prepared by supremely knowledgeable experts. - Most are over 1000 pages. - PROBLEM SOLVERS are not meant to be read cover to cover. They offer whatever may be needed at a given time. An excellent index helps to locate specific problems rapidly. - Educators consider the PROBLEM SOLVERS the most effective and valuable study aids; students describe them as "fantastic" - the best books on the market. TABLE OF CONTENTS Introduction Chapter 1: The Molecular Basis of Life Units and Microscopy Properties of Chemical Reactions

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inherent difficulties of biology: No systematic rules of analysis were ever developed to follow in a step-by-step manner to solve typically encountered problems. This results from numerous different conditions and principles involved in a problem that leads to many possible different solution methods. To prescribe a set of rules for each of the possible variations would involve an enormous number of additional steps, making this task more burdensome than solving the problem directly due to the expectation of much trial and error. Current textbooks normally explain a given principle in a few pages written by a biologist who has insight into the subject matter not shared by others. These explanations are often written in an abstract manner that causes confusion as to the principle's use and application. Explanations then are often not sufficiently detailed or extensive enough to make the reader aware of the wide range of applications and different aspects of the principle being studied. The numerous possible variations of principles and their applications are usually not discussed, and it is left to the reader to discover this while doing exercises. Accordingly, the average student is expected to rediscover that which has long been established and practiced, but not always published or adequately explained. The examples typically following the explanation of a topic are too few in number and too simple to enable the student to obtain a thorough grasp of the involved principles. The explanations do not provide sufficient basis to solve problems that may be assigned for homework or given on examinations. Poorly solved examples such as these can be presented in abbreviated form which leaves out much explanatory material between steps, and as a result requires the reader to figure out the missing information. This leaves the reader with an impression that the problems and even the subject are hard to learn - completely the opposite of what an

example is supposed to do. Poor examples are often worded in a confusing or obscure way. They might not state the nature of the problem or they present a solution, which appears to have no direct relation to the problem. These problems usually offer an overly general discussion - never revealing how or what is to be solved. Many examples do not include accompanying diagrams or graphs, denying the reader the exposure necessary for drawing good diagrams and graphs. Such practice only strengthens understanding by simplifying and organizing biology processes. Students can learn the subject only by doing the exercises themselves and reviewing them in class, obtaining experience in applying the principles with their different ramifications. In doing the exercises by themselves, students find that they are required to devote considerable more time to biology than to other subjects, because they are uncertain with regard to the selection and application of the theorems and principles involved. It is also often necessary for students to discover those "tricks" not revealed in their texts (or review books) that make it possible to solve problems easily. Students must usually resort to methods of trial and error to discover these "tricks," therefore finding out that they may sometimes spend several hours to solve a single problem. When reviewing the exercises in classrooms, instructors usually request students to take turns in writing solutions on the boards and explaining them to the class. Students often find it difficult to explain in a manner that holds the interest of the class, and enables the remaining students to follow the material written on the boards. The remaining students in the class are thus too occupied with copying the material off the boards to follow the professor's explanations. This book is intended to aid students in biology overcome the difficulties described by supplying detailed illustrations of the solution methods that are usually not apparent to

students. Solution methods are illustrated by problems that have been selected from those most often assigned for class work and given on examinations. The problems are arranged in order of complexity to enable students to learn and understand a particular topic by reviewing the problems in sequence. The problems are illustrated with detailed, step-by-step explanations, to save the students large amounts of time that is often needed to fill in the gaps that are usually found between steps of illustrations in textbooks or review/outline books. The staff of REA considers biology a subject that is best learned by allowing students to view the methods of analysis and solution techniques. This learning approach is similar to that practiced in various scientific laboratories, particularly in the medical fields. In using this book, students may review and study the illustrated problems at their own pace; students are not limited to the time such problems receive in the classroom. When students want to look up a particular type of problem and solution, they can readily locate it in the book by referring to the index that has been extensively prepared. It is also possible to locate a particular type of problem by glancing at just the material within the boxed portions. Each problem is numbered and surrounded by a heavy black border for speedy identification.

Focuses on the fundamental aspects of molecular structure and funciton by reviewing key features, and along the way, capsulizing them as a series of concise concepts. Users are encouraged to place the essential knowledge of molecular biology into broad contexts and develop both academic and personal meaning for this discipline.

The Problems Book helps students appreciate the ways in which experiments and simple calculations can lead to an understanding of how cells work by introducing the experimental foundation of cell and molecular biology. Each chapter reviews key terms, tests for understanding basic concepts, and poses research-based problems. The Problems Book has be

Calculations for Molecular Biology and Biotechnology: A Guide to Mathematics in the Laboratory, Second Edition, provides an introduction to the myriad of laboratory calculations used in molecular biology and biotechnology. The book begins by discussing the use of scientific notation and metric prefixes, which require the use of exponents and an understanding of significant digits. It explains the mathematics involved in making solutions; the characteristics of cell growth; the multiplicity of infection; and the quantification of nucleic acids. It includes chapters that deal with the mathematics involved in the use of radioisotopes in nucleic acid research; the synthesis of oligonucleotides; the polymerase chain reaction (PCR) method; and the development of recombinant DNA technology. Protein quantification and the assessment of protein activity are also discussed, along with the centrifugation method and applications of PCR in forensics and paternity testing. Topics range from basic scientific notations to complex subjects like nucleic acid chemistry and recombinant DNA technology Each chapter includes a brief explanation of the concept and covers necessary definitions, theory and rationale for each type of calculation Recent applications of the procedures and computations in clinical,

academic, industrial and basic research laboratories are cited throughout the text New to this Edition: Updated and increased coverage of real time PCR and the mathematics used to measure gene expression More sample problems in every chapter for readers to practice concepts

This book is a collection of papers which reflect the recent trends in the philosophy and history of molecular biology. It brings together historians, philosophers, and molecular biologists who reflect on the discipline's emergence in the 1950's, its explosive growth, and the directions in which it is going. Questions addressed include: (i) what are the limits of molecular biology? (ii) What is the relation of molecular biology to older subdisciplines of biology, especially biochemistry? (iii) Are there theories in molecular biology? (iv) If so, how are these theories structured? (v) What role did information theory play in the rise of molecular biology? The book will open the way for many future researchers.

Protocols used in Molecular Biology is a compilation of several examples of molecular biology protocols. Each example is presented with a concise introduction, materials and chemicals required, a step-by-step procedure and troubleshooting tips. Information about the application of the protocol is also provided. The techniques included in this book are essential to research in the fields of proteomics, genomics, cell culture, epigenetic modification and structural biology. The protocols can also be used by clinical researchers (neuroscientists and oncologists, for example) for medical applications (diagnostics, therapeutics and multidisciplinary projects).