Book Review
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Molecular Biology of The Cell

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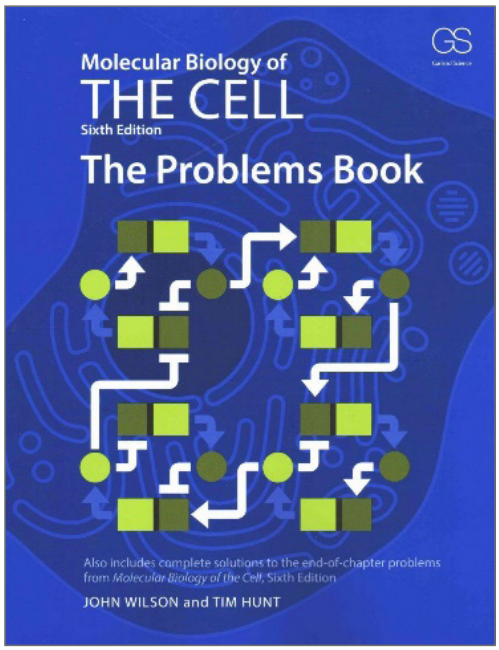

Authors: Bruce Alberts, Alexander Johnson, Julian Lewis, David Morgan, Martin Raff, Keith Roberts, Peter Walter
Title: Molecular Biology of The Cell
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Molecular Biology of the Cell-As the amount of information in biology expands dramatically, it becomes increasingly important for textbooks to distill this vast amount of scientific knowledge into concise principles and enduring concepts. Molecular Biology of the Cell, Sixth Edition accomplishes this goal with clear writing and beautiful illustrations.

The Sixth Edition has been extensively revised and updated with the latest research in cell biology, and it provides an exceptional framework for teaching and learning.

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 been designed to correspond with the first twenty chapters of Molecular Biology of the Cell, Sixth Edition.

Molecular Biology of the Cell sets forth the current understanding of cell biology and it explores the intriguing implications and possibilities of the great deal that remains unknown. The hallmark features of previous editions continue in the sixth edition.

This book has 1465 pages, 5 parts, 24 chapters, 1492 illustrations, 174 animations and videos that are available to students are also available on the instructor's website in two formats. The book is designed with a clean and open, single-column layout. The art program maintains a completely consistent format and style, and includes over 1,600 photographs, electron micrographs, and original drawings by the authors. Clear and concise concept headings introduce each section. Every chapter contains extensive references. Most importantly, every chapter has been subjected to a rigorous, collaborative revision process where, in addition to incorporating comments from expert reviewers, each co-author reads and reviews the other authors' prose. The result is a truly integrated work with a single authorial voice. Features: - Places the latest hot topics sensibly in context - including genomics, protein structure, array technology, stem cells and genetic diseases. - Incorporates and emphasizes new genomic data.

This sixth edition not only confirms the book's pre-eminence but manages to extend it. The writing is very clear and the chapters progress as a narrative, making the experience not only interesting, but also managing to place everything into an appropriate context. Importantly, the information is also very much up to date: for example, the regulation of gene expression by noncoding RNAs is explained in detail, including the roles of small and long noncoding RNAs as well as the bacterial CRISPR system. I also particularly enjoyed the detailed information provided on the complicated issue of stem cells in the intestine in Chapter 22, together with wonderful illustrations and photographs. The breadth of information provided is vast: the first few chapters deal with basic biological and biochemical concepts, with the next few chapters describing genetic principles and regulatory aspects of gene expression. This is followed by extensive information about experimental techniques and new technologies used to study cell structure and analyze gene expression patterns and sequence genomes. For example, real-time PCR and Illumina as well as Ion Torrent sequencing methods are explained and even nanopore technology and quantum dots are mentioned, as are a wide range of methods used to analyze small molecules, proteins and cells. A new and incredibly useful addition is a section on "mathematical analysis of cell functions". It demonstrates how mathematical analysis of the dynamics of molecular interactions such as those regulating gene expression can highlight the roles played by protein/promoter and protein/protein interaction as well as protein stability in generating or repressing transcriptional signals. The translation of the multiple and complex steps involved in these molecular communications into equations provides quantitative information useful for predicting cellular behavior. Since many biologists are mathematically challenged, the clarity of presentation of these concepts will be very much appreciated. The book continues with detailed information on cellular organization and structure as well as interaction of multicellular organisms and ends with descriptions of pathogens and the workings of the immune system. Each chapter ends with a list of essential references. A minor criticism is that it would have been useful to include Pubmed IDs, where relevant. Finally, there is an extensive glossary followed by an index.

In summary, the sixth edition of "Molecular Biology of the Cell", is an exceptionally useful learning and teaching aid that provides clear, in-depth and up-to-date information on cellular molecular biology itself, techniques used to study this topic as well as complementary branches of science. Its complementary companion "The Problems Book" makes both books uniquely useful and important for student and teacher alike and together they are the most useful aids I can think of for anyone interested in learning about and understanding the molecular biology of the cell.