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BOOK REVIEW

Handbook of Molecular and Cellular Methods in Biology and Medicine

(2nd Edition, Cseke, L. J., Kaufman, P. B., Podila, G. K., and Tsai, C.-J. (eds.) CRC Press, Boca Raton-London-New York-Washington, D.C., 2004, 580 p., $116.96)

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The first edition of this book was published in 1955. Since that time the introduction of new ideas and methods has made decisive contributions to many important discoveries in cell biology and medicine. The second edition includes revised and new methodological protocols covering major areas of molecular biology and medicine. The book has been written by a large international group of distinguished experts in this field.

The book consists of 25 chapters. Chapters 1-4 deal with methods of isolation and purification of DNA and RNA; special attention is paid to preparation of nucleic acids containing radioactive and non-radioactive labels and also to the methods of extraction and purification of proteins by means of gel-filtration, ion-exchange, and affinity chromatography, immunoprecipitation, and gel electrophoresis under non-denaturing conditions.

Chapters 5, 6, and 8 describe methods of hybridization of DNA, RNA, and proteins using Southern, Northern, and Western blots, respectively. Chapter 7 describes preparation of mono- and polyclonal antibodies against specific proteins.

Chapters 9-13 describe principles and strategies employed for preparation of cDNA and genomic DNA libraries, methods of analyses of DNA nucleotide sequences, various approaches in directed DNA mutagenesis, and methods for studies of specific DNA-binding proteins (DNA Footprinting).

Chapter 14 deals with methods of RNA extraction, use of reactions catalyzed by reverse transcriptase, methods of polyacrylamide gel electrophoresis under denaturing conditions, and cloning.

Chapter 15 describes functional genomes and DNA-microarray technology.

Chapter 16 describes methods of mRNA translation *in vitro* and protein analysis by gel electrophoresis.

Chapter 17 deals with methods of cultivation of plant tissues and cells in the light of biotechnological approaches: preparation of transgenic plants exhibiting increased resistance to unfavorable environmental factors.

Chapters 18, 19, and 20 describe methods for transfer, expression, and inhibition of animal and plant genes, respectively.

Chapter 21 considers various methodological approaches employed in light, electron, and confocal microscopy.

Chapter 22 deals with methods of localization of gene expression. This chapter considers approaches employed in subcellular and tissues gene expression including gene localization on *in situ* hybridization.

Chapter 23 describes general approaches used during extraction and separation of bioorganic molecules from microbial, plant, and animal cells. This chapter also describes such methods of separation and identification of molecules as different variants of chromatography, capillary zonal electrophoresis, mass-spectrometry, and nuclear magnetic resonance.

Chapter 24 deals with combinatorial methods. This approach is based on high throughput preparation of many individual compounds with similar structure and identification of relationship between their chemical structure and biological features and/or functions. A supplement to this chapter includes a list of companied specializing in synthesis of compounds required for these studies.

The concluding chapter 25 contains description of various useful approaches required for the most effective use of combinatorial libraries using computer-aided analysis.

It should be noted that the authors and editors of this book found the optimal structure for each chapter. Each chapter begins with a short introduction highlighting principles of the method described; then detailed protocol with essential short methodological commentaries of authors is given. This helps the most effective use of such methods in practical work. Each chapter also contains a list of references. The book also has an alphabetical index and many illustrations (tables, schemes, figures, and photographs).

This book is recommended to students of biological and medical faculties and their teachers, and also to a wide audience of biochemists, cell and molecular biologists, and biotechnologists.

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