



Medical Biochemistry

医用生物化学

FOURTH EDITION

N. V. Bhagavan

世界图书出版公司



Medical Biochemistry

医用生物化学

Edited by

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世界图书出版公司

西安 北京 广州 上海

HARCOURT ACADEMIC PRESS

陕版出图字:25-2004-036

图书在版编目(CIP)数据

医用生物化学/(美)博格温(N.V.Bhagavan)主编.—西

安:世界图书出版西安公司,2006.7

ISBN 7-5062-4772-0

I.医... II.博... III.医用化学:生物化学—英文

IV.R525

中国版本图书馆CIP数据核字(2005)第081472号

医用生物化学

主 编 (美)N.V.Bhagavan

策 划 任卫军

责任编辑 汪信武 段 晖

封面设计 高宏超

出版发行 世界图书出版西安公司

地 址 西安市北大街85号

邮 编 710003

电 话 029-87285225 87285507(医学读者俱乐部) 8724941(市场营销部)
87235105(总编室)

传 真 029-87279075 87279676

经 销 各地新华书店

印 刷 人民日报社西安印务中心

开 本 889 mm×1194 mm 1/16

印 张 65.5

字 数 2100千字

彩 插 16页

版 次 2006年7月第1版 2006年7月第1次印刷

书 号 ISBN 7-5062-4772-0/R·525

定 价 450.00元

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Medical Biochemistry, 4/E

ISLA S.MACKENZIE, IAN B.WILKINSON, JOHN R.COCKCROFT

ISBN:0-120-954-400

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Authorized English language reprint edition published by the Proprietor.

ISBN:981-2591-42-7

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Elsevier (Singapore) Pte Ltd.

3 Killiney Road

#08-01 Winsland House I

Singapore 239519

Tel: (65) 6349-0200

Fax: (65) 6733-1817

First Published 2006

2006 年初版

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Sponsoring Editor	Jeremy Hayhurst
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Preproduction	Supplinc
Composition	TechBooks
Printer	Friesens

Cover photo: © Corbis Corporation/ William Whitehurst, 2001.

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Orlando, Florida 32887-6777

Academic Press

A Division of Harcourt, Inc.
525 B Street, Suite 1900, San Diego, California 92101-4495, USA
<http://www.academicpress.com>

Academic Press

Harcourt Place, 32 Jamestown Road, London NW1 7BY, UK
<http://www.academicpress.com>

Harcourt/Academic Press

A Division of Harcourt, Inc.
200 Wheeler Road, Burlington, Massachusetts 01803
<http://www.harcourt-ap.com>

Library of Congress Catalog Card Number: 2001090826

International Standard Book Number: 0-12-095440-0

PRINTED IN CANADA

02 03 04 05 06 FR 9 8 7 6 5 4 3 2

Medical Biochemistry
fourth edition

—— 重 印 版 ——

MEDICAL BIOCHEMISTRY

FOURTH EDITION

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PREFACE

In keeping with the previous editions, the primary purpose of *Medical Biochemistry, Fourth Edition*, is to present the fundamentals of biochemistry and related materials in a way that is useful to students pursuing medical and other health-related careers. The book was conceived and written with the hope that it would generate interest and enthusiasm among these students, particularly because biochemistry has a crucial role in human health and disease. Since it is assumed that most students in medicine and health-related fields eventually will apply biochemical principles to the art of healing, discussion of the factual information is integrated with frequent use of clinical examples and applications.

A vast number of constituents of the human body—cells, enzymes, hormones, sugars, salts, vitamins, and so forth—vary in normal and abnormal states of human health. Understanding the metabolic and regulatory processes that underlie metabolism is essential to any practice of the healing arts and the relief of human suffering. I have tried to keep this idea foremost.

Progress in biochemistry, molecular biology, cellular biology, endocrinology, and other disciplines has been so rapid and profound in the past 20 years that biochemistry texts obsolesce rapidly. To maximize the usefulness of this book, authors actively involved in research have written several chapters dealing with the most rapidly changing fields.

The overall organization of topics is designed to lead the student logically through the biochemical organization of cells. Emphasis is placed on the structures and functions of the molecular components of cells and on metabolic controls. The text begins with a discussion of water, acids, bases, and buffers, amino acids, proteins, and thermodynamics (Chapters 1–5). This is fol-

lowed by a detailed discussion of important aspects of enzymology (Chapters 6–8). The broad subject of carbohydrate chemistry (Chapters 9–11, 13, 15, 16) is integrated with chapters that discuss gastrointestinal digestion (Chapter 12), oxidative phosphorylation (Chapter 14), and protein metabolism (Chapter 17). Three chapters on lipids (Chapters 18–20) are integrated with chapters covering muscle systems (Chapter 21) and metabolic homeostasis (Chapter 22).

The principles of molecular biology including nucleic acid chemistry and the regulation of gene expression and protein synthesis are presented in Chapters 23–26. These chapters are followed by ones on nucleotide, hemoglobin, and heme metabolism (Chapters 27–29). The endocrine system and its organs are discussed in Chapters 30–34. Molecular immunology is presented in Chapter 35, and the biochemistry of blood coagulation appears in Chapter 36. The last section discusses mineral and vitamin metabolism and electrolyte balance (Chapters 37–39). Nine appendices contain tables of nutritional values and clinical laboratory measurements that are important in diagnosis.

The importance of human nutrition is emphasized throughout the text and has not been relegated to a single chapter. Likewise, hereditary disorders are discussed throughout, along with other clinical examples that relate the relevant biochemistry to diagnosis and treatment. This book is not small, although conciseness consistent with clarity was a primary goal. Detailed discussions of experiments have, for the most part, been omitted, and discussion of more subtle points has been minimized. References provided at the end of each chapter will lead interested students deeper into particular topics and case studies.

ACKNOWLEDGMENTS

I am grateful to the authors for their contributions and for sharing their knowledge and insights. I also appreciate their cooperation during the lengthy writing and production process. I am indebted to Gordon Edlin, who participated in and supported all aspects of the publication of this book, to Alan P. Goldstein, who reviewed many chapters and helped integrate basic science and clinical medicine, and Chung-eun Ha for spending tireless hours in the preparation of the manuscript during its many developmental stages.

I am especially appreciative to the following individuals, who contributed to this book as reviewers of selected chapters, as writers of subsections, by offering constructive suggestions, or by providing encouragement and support during difficult times: R. A. Dubanoski, J. M. Hardman, K. H. Higa, S. A. A. Honda, K. Harohalli, D. K. Kikuta, W. Lee, A. A. Manoukian, H. F. Mower, D. S. Park, C. E. Petersen, C. N. Rios, R. T. Sakaguchi, C. E. Sugiyama, and L. E. Takenaka.

My thanks also to the following reviewers for their valuable chapter critiques: Dr. James W. Campbell, Department of Biochemistry and Cell Biology, Rice University; Dr. David Daleke, Department of Biochemistry, Indiana University; Dr. Beverly Delidow, School of Medicine, Marshall University; Dr. JoAnne Flynn, School of Medicine, University of Pittsburgh; Dr. Jennifer A. Pietenpol, School of Medicine, Vanderbilt University; Dr. Connie Prosser, Department of Laboratory Medicine, University of Alberta; Dr. Kevin D. Sarge, Department of Biochemistry, University of Kentucky;

Dr. Peter B. Smith, School of Medicine, Wake Forest University; Dr. Terry Stoming, Department of Biochemistry and Molecular Biology, Medical College of Georgia; Dr. Francis Vella, International Union of Biochemistry and Molecular Biology; and, Dr. D. Eric Walters, Department of Biochemistry and Molecular Biology, The Chicago Medical School.

Dr. Craig M. Jackson acknowledges the images shown in Chapters 35 and 36 were created using RasMol 2.6, Molecular Graphics Visualization Tool by Roger Sayle, Bio-Molecular Structures Group, Glaxo Research & Development, Greenford, Middlesex, UK. RasMol can be obtained at <http://www.umass.edu/microbio/rasmol/>. The coordinates were obtained from the Protein Data Bank at Brookhaven National Laboratory, as described in F. C. Bernstein, T. F. Koetzle, G. J. B. Williams, E. F. Meyer, Jr., M. D. Brice, J. R. Rodgers, O. Kennard, T. Shimanouchi, and M. Tasuxni, "The Protein Data Bank: A Computer-Based Archival File for Macromolecular Structures," *J. Mol. Biol.* **112**, 535–542 (1977). Gene information has been obtained from GenBank, as described in C. Burks, M. Cassidy, M. J. Cinkosky, K. E. Cumella, P. Gilna, J. E-D. Hayden, G. M. Keen, T. A. Kelley, M. Kelly, D. Kristofferson, and J. Ryals GenBank. *Nucl. Acids Res.* **19**(Suppl), 2221–2225 (1991).

For the coordinates of the molecules for which structures are shown, see <http://www.rcsb.org/>.

The author thanks James G. White, M. D., Regents Professor, University of Minnesota, Minneapolis, Minnesota, for the photographs of platelets, and Meir Rigbi,

Professor Emeritus, Hebrew University of Jerusalem, for his many helpful comments on the manuscript.

I also express my thanks to C. Agbayani, J. Gerber, and N. Mead for unfailing assistance in the preparation of

the manuscript. Finally, I greatly appreciate the assistance and advice provided to me by the editorial staff of Harcourt/Academic Press, in particular J. R. Hayhurst, N. M. Donaghy, and R. L. Orbegoso.

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