Medical Biochemistry

医用生物化学

FOURTH EDITION

N. V. Bhagavan

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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 followed 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.

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

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