

Preface

Human Biology is suitable for use in one-semester biology courses that emphasize human physiology and the role that humans play in the biosphere. All students should leave college with a firm grasp of how their bodies normally function and how the human population can become more fully integrated into the biosphere. This knowledge can be applied daily and helps assure our continued survival as individuals and as a species. The application of biological principles to practical human concerns is now widely accepted as a suitable approach to the study of biology because it fulfills a great need. Human beings are frequently called upon to make decisions about their bodies and their environment. Wise decisions require adequate knowledge.

In this edition, as in previous editions, each chapter presents the topic clearly, simply, and distinctly so that students will feel capable of achieving an adult level of understanding. Detailed, high-level scientific data and terminology are not included because I believe that true knowledge consists of working concepts rather than technical facility.

Homeostasis

This edition has a renewed emphasis on homeostasis. The first chapter in Part 2 is entitled "Introduction to Homeostasis". The principles of homeostasis are discussed and the contributions of the various systems to homeostasis are outlined before a feature of the text called a Working Together box is introduced. Working Together boxes throughout the text describe how each organ system works with other systems to achieve homeostasis. In each chapter, an icon calls attention to those portions of the text which discuss homeostasis. Applying Your Knowledge to the Concepts questions at the end of chapter pertain to the maintenance of homeostasis.

The urinary system chapter and the endocrine system chapter were rewritten to better emphasize the contribution of these systems to homeostasis.

Vibrant, New Illustration Program

Almost every illustration in the text is new or has been revised to better engage students in the study of human biology. Students are visually motivated, and the new art program has many features they will find helpful. Visual Focus illustrations give a conceptual overview that relates structure to function. Color coordination includes assigning colors to the various classes of organic molecules and to the different human tissues and organs.

Readings

As in the previous edition, health and ecology concerns are carried through the book by Health Focus and Ecology Focus readings. The Health Focus readings are designed to help students cope with common health problems. The Ecology Focus readings draw attention to a particular environmental problem.

In this edition, students are asked to apply the concepts to the many and varied perplexing bioethical issues that face us every day. Each chapter ends with a description of a bioethical situation that calls for a value judgement on the part of the reader. Students are challenged to develop a point of view by answering a series of questions that deal with the issue. The myriad of issues considered include genetic disease testing, modern reproductive technologies, human cloning, AIDS vaccine trials, animal rights, responsibility for one's health, and fetal research.

Technology

New to this edition, the free *Essential Study Partner* CD-ROM, accompanies the text. A CD-ROM icon has been placed throughout each chapter to remind students that this important learning tool can assist them in reviewing the concepts. *The Dynamic Human 2.0*, which offers a pictorial review of each human system, has been revised to have even more student appeal. The Mader Home Page contains interactive exercises to help students master the objective of each chapter and provides further information on most topics discussed in the text.

Pedagogical Features

As before, *Human Biology* excels in pedagogical features. Each chapter begins with an integrated chapter outline that lists the chapter's concepts according to numbered sections of the chapter. This numbering system is continued in the chapter and summary so that instructors can assign just certain portions of the chapter, if they like. The text is paged so that major sections start at the top of the page and illustrations are on the same or facing page to its reference.

The questions at the end of the chapter are of both the essay and objective type. New to this edition, the Testing Your Knowledge of the Concepts questions include multiple choice, fill in the blanks, and true-false questions. The questions called Applying Your Knowledge to the Concepts help stress the homeostasis theme of the text. All the boldfaced terms in the chapter are listed and page referenced. A matching exercise tests student comprehension of the terms.

Revised Chapters

Almost every chapter in *Human Biology* has been revised. Every systems chapter now has a major section entitled Homeostasis, which outlines how that system works with other systems to maintain homeostasis. The nervous system chapter describes new findings in the field of memory and learning. The cardiovascular system chapter has a new section which pulls together material on pulse rate, blood pressure, and blood flow. In the lymphatic system chapter, the inflammatory reaction has been rewritten. The respiratory system chapter now includes a greater number of respiratory tract infections and disorders. In the chapter on senses, the mechanism of smelling and tasting has been updated. The AIDS Supplement and the chapter on cancer include the latest information on these disorders.

Applications

Educational theory tells us that students are most interested in knowledge of immediate practical application. This text is consistent with and remains true to this approach.

Each chapter begins with a short story that applies chapter material to real-life situations. The readings stress applications and so does the running text material. This edition features expanded treatment of such topics as eating disorders, allergies, pulmonary disorders, hepatitis infections, modern reproductive technologies, the human genome project, and gene therapy. Some topics such as the cloning of animals, xenotransplantation, and gene therapy to treat cancer are new.

New to This Edition

- Homeostasis has a renewed emphasis. An icon calls attention to those portions of the text that discuss homeostasis; each systems chapter has a major section that discusses how that system works with other systems of the body to achieve homeostasis, and Applying Your Knowledge to the Concepts contains questions that pertain to homeostasis.
- Revised Working Together boxes appear in each of the system chapters. These illustrations describe how each organ system works with the other systems to achieve homeostasis, which is also discussed in a major section of the chapter.
- Technology aids are described at the end of each chapter. The *Essential Study Partner* CD-ROM tutorial which supports and enhances the concepts presented is offered free with the text. A CD-ROM icon is used throughout the chapter to remind students to consult this useful learning tool. The *Dynamic Human 2.0* CD-ROM is an interactive three-dimensional visual guide to human anatomy and physiology. The Mader Home Page provides interactive study exercises and further information for each chapter of the text.
- Health Focus and Ecology Focus readings support the two major themes of the text. A new bioethical issue is discussed in a featured section at the end of each chapter. Challenging questions are provided that can be used as a basis for class discussion.
- A new illustration program adds vitality to the art and enhances the appeal of the text. Many new micrographs provide realism. Visual Focus illustrations give a pictorial overview of key topics. Color coding is used both for molecular structures and for human tissues and organs.
- Relevancy of the text is increased with the inclusion or expanded treatment of such topics as eating disorders, allergies, pulmonary disorders, hepatitis infections, xenotransplantation, modern reproductive technologies, human cloning, the human genome project, and gene therapy to treat cancer.