

Preface

Humans are, by nature, curious, and this book is intended to stimulate the curiosity of nonscience students toward gaining an appreciation for the intricacy of human life and our place in the ecosphere. Once piqued, curiosity must rely upon conceptual substance for understanding. We inform students by building a conceptual framework that allows them to better understand their everyday experiences with their bodies and with the world around them. Connections between biological concepts and social issues and the application of these concepts to familiar experiences will support you in your classroom instruction and discussion by helping students see the importance—and excitement—of science in their lives.

The first goal of this textbook is to present the important concepts of human anatomy, physiology, development, genetics, evolution, and ecology. Then, after thoroughly explaining the basic concepts, we apply them in ways that will both interest and benefit the student. For example, a discussion of Alzheimer's disease, depression, and Parkinson's disease follows an explanation of neurotransmitters. When the content is relevant, it gives students a reason to want to learn the information. The chapters on organ systems explain how a healthy system functions, how that system might malfunction, measures to avoid a malfunction, and what current medicine can offer when systems are compromised or fail. Topics that students are likely to encounter in the media on an almost daily basis—smoking, contraception, STDs, cancer, bioterrorism, antibiotic-resistant bacteria—will help students make connections between real-life and classroom activities. Connections between concepts and environmental issues will help students develop a global perspective about environmental issues.

This text answers some very practical questions, including: What type of exercise benefits the heart? How does someone cope with insomnia? How does one protect against unwanted pregnancy and prevent the spread of sexually transmitted diseases? Each of us enters this world with a most intricate machine—our body—but we do not come equipped with an owner's manual. In a sense, this book can be the student's owner's manual. Understanding the information in it and applying it to our own lifestyles and health choices can help each of us live longer, happier, and more productive lives.

The second goal is to help students develop reasoning skills, so they can use the information in situations they face every day in life. Woven throughout each chapter are “stop and think” questions that ask students to apply information to a new situation. When a topic or issue is controversial, the discussion presents both sides of the argument, together with the supporting evidence. Scattered throughout each chapter are “what would you do?” questions that ask the student's opinion or challenge the student to take a stand on a particular issue as well as to identify the criteria used in reaching that decision. These questions foster the practice of thinking

through issues, examining the information available, and making decisions based on that information. Additional critical-thinking questions reside on the Companion Web Site.

The third goal is to help students understand how the choices they make can affect the quality of life for themselves, society, and the planet. The material learned in the textbook or during lecture often bears on social or environmental issues that are important to us all. This text will help you, as the instructor, heighten students' awareness of their impact on the biosphere and prepare students to be responsible citizens and voters. Society is currently grappling with many pressing biological issues—the cloning of human cells, stem cell research, genetically modified foods, gene therapy, organ transplants, defining death, dealing with bioterrorism, and preventing and treating HIV infections, among others—and students need the tools to understand these issues and make informed decisions about them.

To reach these three goals, the text engages the student with applications that will interest them personally and discussions of critical issues facing society. The writing makes the information easily accessible. Each chapter begins with an outline of the major section headings to provide a preview and a framework upon which concepts are developed. These section headings are presented as complete sentences that clearly state the main concept of each section. Illustrated tables offer a way to organize and summarize information to help students see the big picture as well as the details.

The visual program stimulates learning with simple, beautiful illustrations that are supported and enhanced by effective pedagogy. Vibrant, three-dimensional figures show appropriate depth and detail and are clearly accessible and understandable for your students. The illustrations—including molecules and human tissues and organs—are visually consistent in form and structure throughout the text. “Voice balloons” draw the student's attention to a particularly important process or teaching point in many of the figures. Key figures pull concepts together to present the big picture. For example, the chapters on organ systems include figures that show both the anatomical structure and the function of the components of each system. These figures, such as Figure 14.2 of the respiratory system, help students understand the important relationship between structure and function. Micrographs paired with illustrations help students more easily interpret the micrograph by comparing it with the coupled illustration. Reference figures help students locate a particular structure within the body. Figure 4.2, which illustrates types of connective tissue, is an example that pairs micrographs to illustrations and also shows the student where each type of connective tissue is found. Many illustrations provide surrounding context for the particular structure being examined. For example, Figure 8.3, a sagittal section through the brain, includes the surrounding facial features and an illustration of a head to indicate orientation and perspective. Flowcharts visually

walk students through a process so they can follow the discussion step by step as it moves through a sequence of explanations. Difficult concepts are presented using step-by-step figures, with a brief explanation of each step. By breaking a difficult concept into smaller components, such figures help the student understand each step and see how the steps fit together. For example, Figure 9.13 guides the student through the sequence of events involved in hearing, from sound waves hitting the eardrum to the brain's interpretation of neural information from the ear.

Finally, color is used in the visual program to effectively organize information. Where appropriate, color delineates the steps in a process. For example, in Figure 13.15, subtle differences in background shading distinguish different steps in the immune response. In Figure 12.13, a depiction of the electrical activity of the heart, color indicates the progress of a process.

How the Book Is Organized

The text begins with a discussion of the chemistry of life and then moves to cells, tissues, organs, organ systems, and finally to populations and ecosystems. Rarely is it possible to cover all the topics in a human biology text in one semester. Instructors must make difficult decisions about what to include and the order of presentation, and there are many excellent ways of presenting the material. For this reason, the chapters in this text do not depend heavily on material covered in earlier chapters. The independence of chapters allows you to tailor the use of this text to your course. Cross-references are given to direct students to relevant discussions in other chapters.

Features of the Book

CHAPTER OUTLINES

Each chapter begins with an outline that provides a framework upon which the student can organize the information presented. An outline identifies the important concepts and serves as a map of the relationships among these concepts.

SPECIAL TOPIC CHAPTERS

The Special Topic chapters (8a, Drugs and the Mind; 13a, Infectious Disease; 14a, Smoking and Disease; 15a, Nutrition and Weight Control; 17a, Sexually Transmitted Diseases and AIDS; and 21a, Cancer) expand "pure biology" to cover issues that are likely to be of personal interest and therefore motivating to students. The topics address personal health issues and are more thoroughly developed than they could be in an essay. Even if you do not assign these special topics for students to read, we hope that the issues are so pertinent that they will read or at least refer to these chapters as guides to healthier lifestyles.

"STOP AND THINK" QUESTIONS

"Stop and think" questions are scattered throughout each chapter and are intended to engage students in the learning process and to promote active learning. They invite the student to pause, think about the concept explained, and apply that information to a new

situation. They provide periodic checks for the student to determine whether he or she understands the basic concepts.

"WHAT WOULD YOU DO?" QUESTIONS

"What would you do?" questions are also scattered throughout each chapter and raise ethical questions about issues that society faces today. These help the student see the relevance of information learned in a biology classroom to real-life problems or decisions that society must make, including fluoridation of water, routine screening for prostate cancer, the use of animal organs to save human lives, the export of pesticides to developing countries, and the means of slowing the growth of human populations. There is no right answer to any of these questions. They simply point out to the student that there are broad implications to many of the topics discussed. You may choose to use these questions to begin a classroom presentation, to stimulate discussions, or as questions to leave students thinking about a topic outside the classroom.

ESSAYS

The essays apply information and focus on health, social, or environmental issues. Instructors might use these essays to engage students in the classroom or to provide them with information needed for informed in-class discussions. **Health Issue** essays deal primarily with personal health topics. They provide current information on certain health problems that they, their family, or their friends might encounter. Some of the topics discussed in Health Issue essays are acne, osteoporosis, treatments for the common cold, and heartburn. These essays will help students better understand what their physicians may be telling them. The **Social Issue** essays explore some of the ethical or social issues related to the topics under consideration. The topics of Social Issue essays include anabolic steroids, gene testing, stem cells, and cloning. Finally, the **Environmental Issue** essays deal with the ways in which human activities alter the environment or the ways in which the environment influences human health or well-being. Among the topics discussed in Environmental Issues essays are acid rain, asbestos, noise pollution, and global warming.

Pedagogical Features

When students are studying outside the classroom, this text will help them understand the concepts presented during lecture. Some of the features are designed to reinforce details and others to reinforce concepts that were presented in class.

Headings and Summaries The headings are presented as sentences, which state the main point of the sections that follow. Thus, students see the big picture and focus on the explanations that follow. The Reviewing the Concepts summary sections are organized using the main headings of the chapter. Relevant page numbers are included to guide a student from the summary of a topic back to the full text discussion of that topic.

Key Terms and Glossary This text minimizes technical language because it is intended for students who are not science majors.

Nonetheless, some terms must be used even though they may not be familiar to students. The important terms are boldfaced throughout the chapter and are listed as key terms at the end of the chapter. This list also provides chapter page numbers, indicating where each term is defined. A glossary at the end of the book includes all key terms used in the book.

Questions The questions posed at the end of each chapter have a variety of formats. Some are simply for content review; others require more critical thinking to apply the information to new situations. Review questions that require a written answer are followed by the page number of the relevant discussion. This practice will engage students in the learning process by encouraging them to review and understand the relevant material instead of memorizing the answer. Answers to the multiple-choice and fill-in questions are provided in an appendix. Hints for answering the Applying the Concepts questions are also included in an appendix. These hints help students identify the information needed to answer each question; instead of providing a quick answer, the hints guide a student's thinking process.

Icons Icons in the book direct the student to Web tutorials on the Web Site for this text. The Web tutorials cover processes and difficult concepts with animations, interactive exercises, and a quiz to help students assess their understanding of the topic after viewing the animation or completing the exercise.

Relevant Web Sites The front inside text cover lists 160 relevant and useful Web Sites for students who want to explore a topic in more detail. Because the text discusses many health issues that students or their families and friends may face, the list of Web Sites includes resources that can provide support for people with various health problems, including cancer, drug and alcohol abuse, and smoking.

Supplements

A package of supplemental material has been carefully designed for the student and instructor to further facilitate learning and teaching. It includes:

FOR INSTRUCTORS

Instructor Resource Center on CD This is an all-inclusive resource bank for instructors. Instructors will be able to access textbook art, PowerPoint presentations, animations, lecture outlines, and assessment content. The CD also provides instructors with the content needed to build an online course in the WebCT, Blackboard, or CourseCompass course management systems.

Transparencies Includes approximately 400 illustrations from the text on full-color acetates.

Instructors' Manual This manual contains material that will assist instructors in the preparation of lectures, including lecture outlines and hints, suggestions for classroom activities, answers to the end-of-chapter questions, and suggestions for assignments.

Test Item File This file includes over 1000 questions instructors can use to prepare exams. Question types include multiple choice, true/false, short answer/fill-in-the-blank, matching, and labeling.

TestGen EQ Computerized Testing Software In addition to the printed Test Item File, the test questions are also available as part of the TestGen EQ Testing Software, a text-specific testing program that can be networked for administering tests. It also allows instructors to view and edit existing test questions or add their own questions to create a nearly unlimited number of quizzes and tests.

FOR THE STUDENT:

Companion Web Site The Companion Web Site WWW.PREN-HALL.COM/GOODENOUGH includes many resources to help students master the course. *Web Tutorials* consisting of animations, interactive exercises, and quizzes help students master difficult concepts. Web Tutorial icons have been included throughout the book. In addition, the Companion Web Site includes *Practice Tests*, *Vocabulary Review* quizzes with Flashcards, *Critical-Thinking Questions*, and extensive study aids including *Learning Objectives*, *Key Concepts*, a detailed *Chapter Summary*, and *Chapter Study Tips*.

Student Study Guide (printed study aid) By Claudia Douglass, Central Michigan University The Student Study Guide is designed to help students master the topics and concepts covered in the textbook. The study guide includes different types of review questions including multiple choice, fill-in-the-blank, critical thinking, matching, and labeling. It also includes objectives, summaries, key terms, and student study tips.

Laboratory Manual for Biology of Humans by Mimi Bres and Arnold Weisshaar, Prince George's Community College The subject matter and approach to learning of this lab manual make it very appropriate to accompany *Biology of Humans*. It is designed to provide an understanding of the basic principles of human anatomy and physiology, genetics and evolutionary change, ecology, and the impact of human actions on the environment.

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