

Preface

Humans are curious by nature. This book was written to stimulate that curiosity, inspiring appreciation for the intricacy of human biology and the place of humans in the ecosphere. To satisfy that curiosity with solid and current information, we provide students with a conceptual framework for understanding how their bodies work and for dealing with issues relevant to human health in the modern world. We sustain the student's interest by continually illustrating the connections between biological concepts and issues of current social, ethical, and environmental concern. Our central belief is that the application of biological concepts to familiar experiences is the key to helping students see the excitement of science and understand its importance in their lives.

This edition builds on the fourth edition's strengths of clarity, liveliness, consistency, currency, and relevance. The writing is engaging, the explanations straightforward, and the pedagogical framework meticulously constructed. All features are designed to help students identify important facts and ideas, understand them, and appreciate why they matter.

Application of the material to students' interests brings concepts to life and illustrates the ethical and social relevance of human biology. This strategy is especially apparent in the "Special Topic" chapters and the dozens of Special Interest Essays distributed throughout the other chapters.

Practical Goals and Special Features

The principal goals of this textbook are (1) to give a *clear presentation of the fundamental concepts* of human anatomy, physiology, development, genetics, evolution, and ecology; (2) to *apply these concepts* in ways that will both interest and benefit students; (3) to help students *develop reasoning skills* so they can make use of their newly acquired knowledge in the situations they face in daily life; (4) to help students *evaluate the many sources of information* available to them and to select those that are reliable and accurate; and (5) to give students an understanding of how the choices they make can *affect society and the planet, as well as their own quality of life*.

Much of the material covered in human biology has a bearing on ethical, social, and environmental issues that are important to us all. Connections between human biology topics and ethical, social, and environmental issues help students develop a global perspective on their impact on the biosphere and will prepare them to be responsible citizens of their country and the world. Society is currently immersed in many pressing biological debates, and students need the tools to understand these issues and make informed decisions.

New to This Edition

The Fifth Edition includes new features and information that increase application of the material to students' everyday lives and make it more accessible.

- A new **Special Topic** chapter, titled **Becoming a Patient: A Major Decision** has been added. Focusing on how to be a well-informed patient, this new chapter covers topics such as (1) how to select a doctor or hospital; (2) how to get the most out of an appointment with your doctor; (3) the importance of second opinions; and (4) how to research health conditions on your own.
- New **Did You Know?** questions open each chapter and pique students' interest with interesting and little-known facts about the topic that follows.
- New and expanded multiple choice questions are included in the chapter review sections, providing students the opportunity to more thoroughly test their understanding of the material covered.
- Several new **What Would You Do?** boxes place greater focus on the ethical issues associated with each chapter by posing questions that ask the student to take an informed stand on complicated and controversial topics.
- An open, welcoming new design makes the Fifth Edition more student-friendly, easier to read, and more appropriate for this course level.
- The primary section heads in each chapter are now numbered to help students navigate the material and organize concepts as they read through the chapter.
- The MasteringBiology online homework, tutorial, and assessment system replaces the Human Biology Place companion website of previous editions. Each end-of-chapter review includes a reminder that directs students to MasteringBiology to access related quizzes, activities, and more.

Special Topic Chapters

The text contains 10 **Special Topic** chapters: Chapter 1a, **Becoming a Patient: A Major Decision**; Chapter 8a, **Drugs and the Mind**; Chapter 10a, **Diabetes Mellitus**; Chapter 12a, **Cardiovascular Disease**; Chapter 13a, **Infectious Disease**; Chapter 15a, **Food Safety and Defense**; Chapter 17a, **Sexually Transmitted Diseases and AIDS**; Chapter 18a, **Autism Spectrum Disorder**; Chapter 19a, **Stem Cells—A Repair Kit for the Body**; and Chapter 21a, **Cancer**. Created to further motivate students to learn, each of these short chapters builds on the "pure biology" presented in the immediately preceding chapter to cover issues likely to be of personal interest. The discussions these chapters

contain are more thoroughly developed than would be possible in a boxed essay. Even if instructors do not include these special topics in their reading assignments, we believe the issues are so pertinent to students that they will read the special topic chapters of their own volition, or at least refer to them occasionally as guides to a healthier lifestyle.

Much of the information offered in the text is practical: What can be done to prevent the spread of sexually transmitted diseases? How should food be selected, prepared, and stored to reduce the chances of foodborne illness? The body each of us is born with is a most intricate machine, but it does not come equipped with an owner's manual. In a sense, this book can be the students' owner's manual. Studying and applying the lessons to their individual lifestyles and health issues can help students live longer, happier, and more productive lives.

Special Interest Essays

Three categories of **Special Interest Essays** use the basic scientific content of the chapters to explore issues having broader impact on individual health, society, and the environment.

Environmental Issue essays deal with ways in which human activities alter the environment or, conversely (sometimes simultaneously), ways in which the environment influences human health. Among the topics discussed in Environmental Issue essays are asbestos, genetically modified foods, and noise pollution.

Ethical Issue essays explore ethical and social issues related to the topics in a chapter. They explore questions concerning such subjects as anabolic steroid use, gene testing, and the use of primates in research.

Finally, **Health Issue** essays deal primarily with personal health topics. They provide current information on certain health problems that students, their families, or their friends might encounter. Topics discussed in Health Issue essays include acne, osteoporosis, treatments for the common cold, and disparities in health and health care.

All of these essays include **Questions to Consider** that ask students to think about the ethical implications of certain behaviors (such as taking anabolic steroids) or medical procedures (such as generating extra embryos as part of infertility treatments).

Stop and Think Questions

The **Stop and Think** questions scattered throughout each chapter are intended to promote active learning. They invite the students to pause in their reading to think about the information that was just presented and apply it to a new and interesting situation. These periodic checks allow the students to determine whether they have followed and understood the basic chapter content. In the Fifth Edition we have increased the number of **Stop and Think** questions in each of the main chapters and added these questions to the Special Topic chapters.

What Would You Do? Questions

The **What Would You Do?** questions, which are also placed throughout each chapter, challenge the student to form an opinion or to take a stand on a particular issue that society

faces today, as well as to identify the criteria used in reaching that opinion or decision. These questions help students see the relevance of biology to real-life problems and foster the practice of thinking through such complicated issues: the use of sperm-sorting technology by parents to select the gender of their offspring and strategies for slowing the growth of human populations. When the subject of one of these questions is controversial, the text presents examples of arguments from both sides, as well as evidence in support of competing arguments.

Did You Know? Boxes

The new **Did You Know?** boxes at the start of each chapter pique students' interest with little-known facts about the topic that follows. These features provide an engaging introduction to the material, most often by providing information that students can relate to their everyday lives.

Enticing Illustration and Design Program

Users of previous editions—instructors and students alike—were unreservedly enthusiastic in praising the illustration program for their appeal and helpfulness. The visual program consists of simple but elegantly rendered illustrations that have been carefully designed for effective pedagogy. Their very beauty stimulates learning. This is particularly true of the many vibrant, three-dimensional anatomical figures, whose realistic style and appropriate depth and detail make them easy for students to interpret and use for review. Micrographs often appear side by side with illustrations to aid interpretation and understanding and to give the actual view of a structure or process being studied.

Within each category of illustrations—from molecular models to depictions of human tissues and organs—the figures are consistent in plan and style throughout the text. Numerous key figures pull concepts together to present the “big picture.” Reference figures help students locate particular structures within the body. Flowcharts walk students through a process one step at a time so they can visually follow the progress of a discussion after they have read an explanation in the body of the text. Similarly, step-by-step figures break complex concepts down into simpler components. Finally, color is used in the visual program as an effective means of organizing information and maintaining consistency throughout the text.

Figure Questions

A question accompanies at least one figure in each chapter. This feature asks a question prompting students to pause and critically examine the information in the figure. Answers are provided below the figure legend.

Engaging Design

This Fifth Edition of *Biology of Humans* presents an engaging design that was created to complement the vibrancy of the illustrations, clarify the organizational structure of the chapters, and increase overall readability.