

Preface to the Seventh Edition

Before I began work on the *first* edition of this text, I drew up a number of basic guidelines regarding the type of book I planned to write.

- I wanted a text suited for an introductory course in cell and molecular biology that ran either a single semester or 1–2 quarters. I set out to draft a text of about 800 pages that would not overwhelm or discourage students at this level.
- I wanted a text that elaborated on fundamental concepts, such as the relationship between molecular structure and function, the dynamic character of cellular organelles, the use of chemical energy in running cellular activities and ensuring accurate macromolecular biosynthesis, the observed unity and diversity at the macromolecular and cellular levels, and the mechanisms that regulate cellular activities.
- I wanted a text that was grounded in the experimental approach. Cell and molecular biology is an experimental science and, like most instructors, I believe students should gain some knowledge of how we know what we know. With this in mind, I decided to approach the experimental nature of the subject in two ways. As I wrote each chapter, I included enough experimental evidence to justify many of the conclusions that were being made. Along the way, I described the salient features of key experimental approaches and research methodologies. Chapters 8 and 9, for example, contain introductory sections on techniques that have proven most important in the analysis of cytomembranes and the cytoskeleton, respectively. I included brief discussions of selected experiments of major importance in the body of the chapters to reinforce the experimental basis of our knowledge. I placed the more detailed aspects of methodologies in a final “techniques chapter” because (1) I did not want to interrupt the flow of discussion of a subject with a large tangential section on technology and (2) I realized that different instructors prefer to discuss a particular technology in connection with different subjects.

For students and instructors who wanted to explore the experimental approach in greater depth, I included an Experimental Pathways at the end of most chapters. Each of these narratives describes some of the key experimental findings that have led to our current understanding of a particular subject that is relevant to the chapter at hand. Because the scope of the narrative is limited, the design of the experiments can be considered in some detail. The figures and tables provided in these sections are often those that appeared in the original research article, which provides the reader an opportunity to examine original data and to realize that its analysis is not beyond their means. The Experimental Pathways also illustrate the stepwise nature of scientific discovery, showing how the result of one study raises questions that provide the basis for subsequent studies.

- I wanted a text that was interesting and readable. To make the text more relevant to undergraduate readers, particularly premedical students, I included The Human Perspective. These sections illustrate that virtually all human disorders can

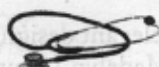
be traced to disruption of activities at the cellular and molecular level. Furthermore, they reveal the importance of basic research as the pathway to understanding and eventually treating most disorders. In Chapter 11, for example, The Human Perspective describes how small synthetic siRNAs may prove to be an important new tool in the treatment of cancer and viral diseases, including AIDS. In this same chapter, the reader will learn how the action of such RNAs were first revealed in studies on plants and nematodes. It becomes evident that one can never predict the practical importance of basic research in cell and molecular biology. I have also tried to include relevant information about human biology and clinical applications throughout the body of the text.

- I wanted a high-quality illustration program that helped students visualize complex cellular and molecular processes. To meet this goal, many of the illustrations have been “stepped-out” so that information can be more easily broken down into manageable parts. Events occurring at each step are described in the figure legend and/or in the corresponding text. I also sought to include a large number of micrographs to enable students to see actual representations of most subjects being discussed. Included among the images are many fluorescence micrographs that illustrate either the dynamic properties of cells or provide a means to localize a specific protein or nucleic acid sequence. Wherever possible, I have tried to pair line art drawings with micrographs to help students compare idealized and actual versions of a structure.

The most important changes in the seventh edition can be delineated as follows:

- Each of the illustrations has been carefully scrutinized and a large number of drawings have been modified with the goal of achieving greater consistency and quality. Particular attention has been paid to the continuity of color and rendering style for each structure and element, as they are represented within each figure, and throughout the book.
- The illustration program for the seventh edition includes a new feature called Figure in Focus. The premise of this feature is to highlight one of the chapter’s key topics in a visually interesting way. Focusing attention on these figures, through the use of line art, 3D molecular models, and micrographs, provides a clear visual explanation of one of the chapter’s core concepts.
- The body of information in cell and molecular biology is continually changing, which provides much of the excitement we all feel about our selected field. Even though only three years have passed since the publication of the sixth edition, nearly every discussion in the text has been modified to a greater or lesser degree. This has been done without allowing the chapters to increase significantly in length.
- Altogether, the seventh edition contains more than 100 new micrographs and computer-derived images, all of which were provided by the original source.

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Clinical and Experimental Focus!



- Clinical Case Studies and accompanying questions by Claire Walczak, Indiana University & Anthony Contento, SUNY Oswego.
- Clinical Connections Questions by Sarah VanVickle-Chavez, Washington University in St. Louis.
- Experimental Pathways Questions by Joel Piperberg, Millersville University.
- NEW Figure in Focus feature by Anthony Contento, SUNY Oswego, New podcasts & assessment questions accompany selected figures, highlighting important concepts & processes.

Book Companion Site (www.wiley.com/college/karp)

For the Student

- Quizzes for student self-testing.
- *Biology NewsFinder*; *Flash Cards*; and *Animations*.
- Answers to the end-of chapter Analytic Questions.
- Additional reading resources provide students with an extensive list of additional useful sources of information.
- Experimental Pathways for Chapters 5, 6, 7, 9, 12, 13, and 15.

For the Instructor

- Biology Visual Library; all images in jpg and PowerPoint formats.
- Instructor's Manual; Test Bank; Clicker Questions; Lecture PowerPoint Presentations.

Instructor Resources are password protected.

Acknowledgments

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