

NEW TO THE SEVENTH EDITION

Major additions to the seventh edition focus on evolutionary principles and taxonomy. Evolutionary concepts must be presented clearly and convincingly in biology courses. We believe that changes we have made will help instructors to accomplish that goal by providing more evidence of evolution, more examples to illustrate evolutionary principles, and more detail on evolutionary mechanisms. Recent, fast-paced changes in animal taxonomy require constant reevaluation of the presentation of evolutionary relationships between animal taxa. Because the taxonomy of many animal groups is unsettled, we have tried to take a conservative, yet up-to-date, position on taxonomic revisions. The following are major additions to this edition.

- “How Do We Know” boxes appear in most chapters. These boxes provide insight into how biologists have arrived at conclusions regarding a variety of biological processes.
- “Evolutionary Insights” boxes have been expanded into Part Three. These boxes describe ideas regarding the evolution of animal organ systems and processes.
- All chapters have been carefully edited. All chapter revisions include minor to substantial changes in wording, artwork, photographs, and content. The following chapters have substantial changes.
 - Chapter 4 has expanded coverage of molecular biology and phylogeny.
 - Chapter 5 has expanded coverage of the role of mutations in evolutionary change and documentation of sympatric speciation events.
 - Chapter 8 has been completely reorganized by the inclusion of the most recent taxonomic relationships among protists as revealed by molecular studies. A new figure has been developed that shows the tentative phylogeny of the protozoan-like eukaryotes based on 18S rRNA sequence comparisons.
 - Chapter 11 has been revised to reflect the division of the aschelminths into lophotrochozoan and ecdysozoan groupings.
 - Chapter 18 has updated taxonomy and coverage of the evolution of tetrapod limbs, including evidence from both paleontology and Hox studies.
 - Chapter 19 now includes expanded coverage of amphibian skin glands and feeding.
 - Chapter 20 includes updated taxonomy, an expanded discussion of turtle navigation, and new information on endangered turtles.
 - Chapter 21 has been revised to include more information on the evolution of birds and feathered dinosaurs. It also includes the latest information on feather development and evolution. The new title of this chapter, “Birds: Reptiles by Another Name,” reflects the content revisions present in this chapter.
 - Chapter 22 has undergone major revision with the addition of a new section on human evolution. New information on the evolution of mammary glands is also included.
 - Chapter 23 includes new information on the function of vitamin D₃ in the skin, the molecular basis of amoeboid movement, and animal movement.

- Chapter 24 contains new information on the role of graded potentials in the nervous system. The section on the sense of smell has been completely rewritten based on new findings in the physiology of olfaction.
- Chapter 25 has a new section on autocrine and paracrine agents, and newly discovered hormones have been added to the table that describes major mammalian tissues and hormones.
- As with the previous edition, chapters on cell chemistry, energy and enzymes, embryology, and animal behavior—along with numerous boxed readings and pedagogical elements—have been moved to the Online Learning Center. This content-rich website is located at www.mhhe.com/millerharley7e

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The publication of a textbook requires the efforts of many people. We are grateful for the work of our colleagues at McGraw-Hill, who have shown extraordinary patience, skill, and commitment to this textbook: Marge Kemp, our Publisher, has helped shaped