



General, Organic, and Biochemistry, 10th ed.
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General Revisions:

Chapter Introductions were rewritten and some chapter opening photos updated in order to better focus on student engagement. The new chapter introduction design leads students directly to the learning goals of the chapter.

“**Strategies for Success**” sections were added at the beginning of Chapters 1, 10, and 16 to provide students with tools for the most effective study methods to help them master the content and concepts most important to success in general, organic, and biochemistry. In-chapter questions and end-of-chapter problems have also been added to assess students’ understanding of the tools and methods presented in the new Strategies sections.

Many updated **photos** emphasizing relevant material and applications have been added within all chapters.

The colors in the **artwork, chemical structures, and equations** throughout the text were revised for accessibility, emphasis, clarity, and consistency. Color has also been used in many areas to help students better understand chemical structure, stereochemistry, and reactions. The Chapter Maps were also revised as necessary to better reflect key concepts emphasized in learning goals.

A set of **Multiple Concept Problems** has been added at the end of each chapter, designed to *help students connect various concepts that are emphasized throughout each chapter*. Many other new problems have also been added, both in the text and within the end-of-chapter problem sets, increasing the variety of problems for instructors and students alike.

Several new **Perspective** boxes to help students relate the topics from the text to real-world situations were added throughout: in Chapter 8, Human Perspective: Lithium-Ion Batteries; in Chapter 10, Human Perspective: The Father of Organic Chemistry; in Chapter 12, Kitchen Chemistry: Sugar Alcohols and the Sweet Tooth; in Chapter 13, Green Chemistry: Aldehydes, Stink Bugs, and Wine; in Chapter 15, Green Chemistry: Neoniconoids and Honey Bees; in Chapter 16, Medical Perspective: Chemistry through the Looking Glass; and in Chapter 20, Medical Perspective: CRISPR Technology and the Future of Genetics.

Chapter-Specific Revisions

Chapter 4 A new abbreviated Section 4.8, Oxidation-Reduction Reactions, now appears in this chapter, with more detailed coverage revisited in Chapter 8 Acids and Bases and Oxidation-Reduction.

Chapter 8 This chapter includes a new section, Section 8.5, Oxidation-Reduction Processes, with a new figure illustrating the relationship between a voltaic cell and an electrolytic cell and a new Human Perspective box on lithium-ion batteries, explaining why lithium is used in lightweight, rechargeable batteries and why the use of lithium in these batteries also leads to safety issues.

Chapter 12 Additional information on the physical properties of thiols is included.

Chapter 14 Section 14.1, Structure and Physical Properties, was revised to include the general structures of aliphatic and aromatic carboxylic acids, and Section 14.2, Structure and Physical Properties, was revised to include the general structures of aliphatic and aromatic esters.

Chapter 15 The information on semisynthetic penicillins was updated, and information on augmentin was added. The material on opiate biosynthesis was updated, and information on the abuse of suboxone was added to the coverage on the mutant poppy.

Chapter 17 The coverage of LDL receptor-mediated endocytosis in Section 17.5 was revised and updated, and a new table summary of the composition of lipoproteins was added.

Chapter 18 The chapter includes a new Section 18.1, Protein Functions, to help students recognize the importance of the information.

Chapter 20 Material was added to Section 20.1, The Structure of the Nucleotide, and Section 20.10 includes new information on handheld DNA sequencers.

Chapter 21 Introductory paragraphs were added to Section 21.1 to tie in catabolism and anabolism with life and life processes. Margin notes were added to the sections on the reactions of glycolysis, and to the section on glycogenesis, to revisit the reactions of organic chemistry and to reinforce the new section on How to Succeed in Biochemistry.

Chapter 22 Section 22.1 was revised to include new content on the non-ATP related functions of mitochondria.