

Brief Contents

PART 1



CHEMISTRY AND GENETICS, 1

- 1 The Mendelian View of the World, 5
- 2 Nucleic Acids Convey Genetic Information, 19
- 3 The Importance of Weak Chemical Interactions, 43
- 4 The Importance of High-Energy Bonds, 57
- 5 Weak and Strong Bonds Determine Macromolecular Structure, 71

PART 2



MAINTENANCE OF THE GENOME, 95

- 6 The Structures of DNA and RNA, 101
- 7 Genome Structure, Chromatin, and the Nucleosome, 135
- 8 The Replication of DNA, 195
- 9 The Mutability and Repair of DNA, 257
- 10 Homologous Recombination at the Molecular Level, 283
- 11 Site-Specific Recombination and Transposition of DNA, 319

PART 3



EXPRESSION OF THE GENOME, 371

- 12 Mechanisms of Transcription, 377
- 13 RNA Splicing, 415
- 14 Translation, 457
- 15 The Genetic Code, 521

PART 4



REGULATION, 541

- 16 Transcriptional Regulation in Prokaryotes, 547
- 17 Transcriptional Regulation in Eukaryotes, 589
- 18 Regulatory RNAs, 633
- 19 Gene Regulation in Development and Evolution, 661
- 20 Genome Analysis and Systems Biology, 703

PART 5



METHODS, 733

- 20 Techniques of Molecular Biology, 739
- 21 Model Organisms, 783

Index, 819