

CONTENTS IN BRIEF

INTRODUCTION

- 1 Methods and Concepts in Biology 2

I THE CELLULAR BASIS OF LIFE

- 2 Chemical Foundations for Cells 16
- 3 Carbon Compounds in Cells 32
- 4 Cell Structure and Function 50
- 5 A Closer Look at Cell Membranes 76
- 6 Ground Rules of Metabolism 92
- 7 Energy-Acquiring Pathways 106
- 8 Energy-Releasing Pathways 122

II PRINCIPLES OF INHERITANCE

- 9 Cell Division and Mitosis 140
- 10 Meiosis 154
- 11 Observable Patterns of Inheritance 168
- 12 Chromosomes and Human Genetics 186
- 13 DNA Structure and Function 208
- 14 From DNA to Proteins 218
- 15 Control of Gene Expression 234
- 16 Recombinant DNA and Genetic Engineering 246

III PRINCIPLES OF EVOLUTION

- 17 Emergence of Evolutionary Thought 260
- 18 Microevolution 270
- 19 Speciation 286
- 20 The Macroevolutionary Puzzle 300

IV EVOLUTION AND DIVERSITY

- 21 The Origin and Evolution of Life 322
- 22 Bacteria and Viruses 346
- 23 Protists 362
- 24 Fungi 378
- 25 Plants 390
- 26 Animals: The Invertebrates 408
- 27 Animals: The Vertebrates 444
- 28 Human Evolution: A Case Study 470

V PLANT STRUCTURE AND FUNCTION

- 29 Plant Tissues 482
- 30 Plant Nutrition and Transport 500
- 31 Plant Reproduction 514
- 32 Plant Growth and Development 530

VI ANIMAL STRUCTURE AND FUNCTION

- 33 Tissues, Organ Systems, and Homeostasis 546
- 34 Information Flow and the Neuron 560
- 35 Integration and Control: Nervous Systems 574
- 36 Sensory Reception 592
- 37 Integration and Control: Endocrine Systems 612
- 38 Protection, Support, and Movement 630
- 39 Circulation 652
- 40 Immunity 674
- 41 Respiration 694
- 42 Digestion and Human Nutrition 714
- 43 Water-Solute Balance and Temperature Control 734
- 44 Principles of Reproduction and Development 752
- 45 Human Reproduction and Development 772

VII ECOLOGY AND BEHAVIOR

- 46 Population Ecology 802
- 47 Community Interactions 822
- 48 Ecosystems 844
- 49 The Biosphere 864
- 50 Human Impact on the Biosphere 892
- 51 An Evolutionary View of Behavior 910
- 52 Adaptive Value of Social Behavior 920