

# Brief Contents

## PART I

### Fundamentals of Physiology 1

- 1 Animals and Environments: Function on the Ecological Stage 3
- 2 Molecules and Cells in Animal Physiology 35
- 3 Genomics, Proteomics, and Related Approaches to Physiology 71
- 4 Physiological Development and Epigenetics 89
- 5 Transport of Solutes and Water 103

## PART II

### Food, Energy, and Temperature 129

- 6 Nutrition, Feeding, and Digestion 131
- 7 Energy Metabolism 165
- 8 Aerobic and Anaerobic Forms of Metabolism 189
- 9 The Energetics of Aerobic Activity 215
- 10 Thermal Relations 233
- 11 Food, Energy, and Temperature **AT WORK:**  
The Lives of Mammals in Frigid Places 287

## PART III

### Integrating Systems 303

- 12 Neurons 305
- 13 Synapses 337
- 14 Sensory Processes 369
- 15 Nervous System Organization and Biological Clocks 407
- 16 Endocrine and Neuroendocrine Physiology 429
- 17 Reproduction 465
- 18 Integrating Systems **AT WORK:**  
Animal Navigation 497

## PART IV

### Movement and Muscle 513

- 19 Control of Movement: The Motor Bases of Animal Behavior 515
- 20 Muscle 537
- 21 Movement and Muscle **AT WORK:**  
Plasticity in Response to Use and Disuse 565

## PART V

### Oxygen, Carbon Dioxide, and Internal Transport 583

- 22 Introduction to Oxygen and Carbon Dioxide Physiology 585
- 23 External Respiration: The Physiology of Breathing 599
- 24 Transport of Oxygen and Carbon Dioxide in Body Fluids (with an Introduction to Acid-Base Physiology) 635
- 25 Circulation 667
- 26 Oxygen, Carbon Dioxide, and Internal Transport **AT WORK:**  
Diving by Marine Mammals 701

## PART VI

### Water, Salts, and Excretion 721

- 27 Water and Salt Physiology: Introduction and Mechanisms 723
- 28 Water and Salt Physiology of Animals in Their Environments 741
- 29 Kidneys and Excretion (with Notes on Nitrogen Excretion) 779
- 30 Water, Salts, and Excretion **AT WORK:**  
Mammals of Deserts and Dry Savannas 815