

# CONTENTS IN BRIEF

- 1 Studying the Nervous System 1

## **Unit I Neural Signaling**

- 2 Electrical Signals of Nerve Cells 25
- 3 Voltage-Dependent Membrane Permeability 41
- 4 Ion Channels and Transporters 57
- 5 Synaptic Transmission 77
- 6 Neurotransmitters and Their Receptors 109
- 7 Molecular Signaling within Neurons 141
- 8 Synaptic Plasticity 163

## **Unit II Sensation and Sensory Processing**

- 9 The Somatic Sensory System: Touch and Proprioception 189
- 10 Pain 209
- 11 Vision: The Eye 229
- 12 Central Visual Pathways 257
- 13 The Auditory System 277
- 14 The Vestibular System 303
- 15 The Chemical Senses 321

## **Unit III Movement and Its Central Control**

- 16 Lower Motor Neuron Circuits and Motor Control 353
- 17 Upper Motor Neuron Control of the Brainstem and Spinal Cord 375
- 18 Modulation of Movement by the Basal Ganglia 399
- 19 Modulation of Movement by the Cerebellum 417
- 20 Eye Movements and Sensory Motor Integration 435
- 21 The Visceral Motor System 451

## **Unit IV The Changing Brain**

- 22 Early Brain Development 477
- 23 Construction of Neural Circuits 507
- 24 Modification of Neural Circuits as a Result of Experience 537
- 25 Repair and Regeneration in the Nervous System 559

## **Unit V Complex Brain Functions**

- 26 Association Cortex and Cognition 587
- 27 Speech and Language 607
- 28 Sleep and Wakefulness 625
- 29 Emotions 647
- 30 Sex, Sexuality, and the Brain 669
- 31 Memory 695

**Appendix:** Survey of Human Neuroanatomy 717

**Atlas:** The Human Central Nervous System 745