

CONTENTS

SECTION I

INTRODUCTION

- 1 Foundations of Physiology, 2**
Emile L. Boulpaep and Walter F. Boron

SECTION II

PHYSIOLOGY OF CELLS AND MOLECULES

- 2 Functional Organization of the Cell, 8**
Michael J. Caplan
- 3 Signal Transduction, 47**
Lloyd Cantley
- 4 Regulation of Gene Expression, 73**
Peter Igarashi
- 5 Transport of Solutes and Water, 102**
Peter S. Aronson, Walter F. Boron, and Emile L. Boulpaep
- 6 Electrophysiology of the Cell Membrane, 141**
Edward G. Moczydlowski
- 7 Electrical Excitability and Action Potentials, 173**
Edward G. Moczydlowski
- 8 Synaptic Transmission and the Neuromuscular Junction, 204**
Edward G. Moczydlowski
- 9 Cellular Physiology of Skeletal, Cardiac, and Smooth Muscle, 228**
Edward G. Moczydlowski

SECTION III

THE NERVOUS SYSTEM

- 10 Organization of the Nervous System, 254**
Bruce R. Ransom
- 11 The Neuronal Microenvironment, 275**
Bruce R. Ransom
- 12 Physiology of Neurons, 295**
Barry W. Connors
- 13 Synaptic Transmission in the Nervous System, 307**
Barry W. Connors
- 14 The Autonomic Nervous System, 334**
George B. Richerson
- 15 Sensory Transduction, 353**
Barry W. Connors
- 16 Circuits of the Central Nervous System, 390**
Barry W. Connors

SECTION IV

THE CARDIOVASCULAR SYSTEM

- 17 Organization of the Cardiovascular System, 410**
Emile L. Boulpaep
- 18 Blood, 429**
Emile L. Boulpaep
- 19 Arteries and Veins, 447**
Emile L. Boulpaep
- 20 The Microcirculation, 461**
Emile L. Boulpaep
- 21 Cardiac Electrophysiology and the Electrocardiogram, 483**
W. Jonathan Lederer
- 22 The Heart as a Pump, 507**
Emile L. Boulpaep
- 23 Regulation of Arterial Pressure and Cardiac Output, 533**
Emile L. Boulpaep
- 24 Special Circulations, 556**
Steven S. Segal
- 25 Integrated Control of the Cardiovascular System, 572**
Emile L. Boulpaep

SECTION V

THE RESPIRATORY SYSTEM

- 26 Organization of the Respiratory System, 590**
Walter F. Boron
- 27 Mechanics of Ventilation, 606**
Walter F. Boron
- 28 Acid-Base Physiology, 628**
Walter F. Boron
- 29 Transport of Oxygen and Carbon Dioxide in the Blood, 647**
Walter F. Boron
- 30 Gas Exchange in the Lungs, 660**
Walter F. Boron
- 31 Ventilation and Perfusion of the Lungs, 675**
Walter F. Boron
- 32 Control of Ventilation, 700**
George B. Richerson and Walter F. Boron

SECTION VI**THE URINARY SYSTEM**

- 33 Organization of the Urinary System, 722**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson
- 34 Glomerular Filtration and Renal Blood Flow, 739**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson
- 35 Transport of Sodium and Chloride, 754**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson
- 36 Transport of Urea, Glucose, Phosphate, Calcium, Magnesium, and Organic Solutes, 770**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson
- 37 Transport of Potassium, 792**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson
- 38 Urine Concentration and Dilution, 806**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson
- 39 Transport of Acids and Bases, 821**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson
- 40 Integration of Salt and Water Balance, 836**
Gerhard Giebisch, Erich E. Windhager, and Peter S. Aronson

SECTION VII**THE GASTROINTESTINAL SYSTEM**

- 41 Organization of the Gastrointestinal System, 852**
Henry J. Binder
- 42 Gastric Function, 863**
Henry J. Binder
- 43 Pancreatic and Salivary Glands, 879**
Christopher R. Marino and Fred S. Gorelick
- 44 Intestinal Fluid and Electrolyte Movement, 899**
Henry J. Binder
- 45 Nutrient Digestion and Absorption, 914**
Henry J. Binder and Charles M. Mansbach II
- 46 Hepatobiliary Function, 944**
Frederick J. Suchy

SECTION VIII**THE ENDOCRINE SYSTEM**

- 47 Organization of Endocrine Control, 974**
Eugene J. Barrett

- 48 Endocrine Regulation of Growth and Body Mass, 990**
Eugene J. Barrett
- 49 The Thyroid Gland, 1006**
Eugene J. Barrett
- 50 The Adrenal Gland, 1018**
Eugene J. Barrett
- 51 The Endocrine Pancreas, 1035**
Eugene J. Barrett
- 52 The Parathyroid Glands and Vitamin D, 1054**
Eugene J. Barrett and Paula Q. Barrett

SECTION IX**THE REPRODUCTIVE SYSTEM**

- 53 Sexual Differentiation, 1072**
Sam Mesiano and Ervin E. Jones
- 54 The Male Reproductive System, 1092**
Sam Mesiano and Ervin E. Jones
- 55 The Female Reproductive System, 1108**
Sam Mesiano and Ervin E. Jones
- 56 Fertilization, Pregnancy, and Lactation, 1129**
Sam Mesiano and Ervin E. Jones
- 57 Fetal and Neonatal Physiology, 1151**
George Lister and Ervin E. Jones

SECTION X**PHYSIOLOGY OF EVERYDAY LIFE**

- 58 Metabolism, 1170**
Gerald I. Shulman and Kitt Falk Petersen
- 59 Regulation of Body Temperature, 1193**
Shaun F. Morrison
- 60 Exercise Physiology and Sports Science, 1204**
Steven S. Segal
- 61 Environmental Physiology, 1223**
Arthur DuBois
- 62 The Physiology of Aging, 1235**
Edward J. Masoro

Index, 1249