

1. Record Nr.	UNINA9910595027803321
Autore	Gallardo Pedro A.
Titolo	Renal physiology and hydrosaline metabolism // Pedro A. Gallardo and Carlos P. Vio
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	3-031-10256-8
Descrizione fisica	1 online resource (286 pages)
Disciplina	612.463
Soggetti	Physiology, Comparative Kidneys - Physiology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Preface to the Second Edition -- Acknowledgments -- Contents -- About the Authors -- 1: General Kidney Functions -- 1.1 Excretion of Nitrogenous Metabolites -- 1.2 Conservation of Organic Solutes That Are Valuable to the Body -- 1.3 Regulation of Plasma Osmolality -- 1.4 Regulation of the Effective Circulating Volume -- 1.5 Regulation of the Acid-Base Balance -- 1.6 Regulation of Potassium Balance -- 1.7 Regulation of Calcium and Phosphate Balance -- 1.8 Endocrine Function -- 1.9 Extrarenal Organs in the Maintenance of the Hydrosaline Balance -- 1.10 Nomenclature of Solute Carriers, Water, and Ion Channels -- 1.11 Conclusions -- Bibliography -- 2: Functional Anatomy of the Kidney -- 2.1 General Structure of the Kidney -- 2.2 Nephron Structure -- 2.2.1 Renal Corpuscle -- 2.2.1.1 Juxtaglomerular Apparatus (JGA) -- 2.2.2 Renal Tubule -- 2.3 Proximal Tubule -- 2.4 Loop of Henle -- 2.5 Distal Nephron -- 2.5.1 Distal Convoluted Tubule -- 2.5.2 Connecting Tubule -- 2.5.3 Cortical Collecting Duct (CCD) -- 2.5.4 Medullary Collecting Duct (MCD) -- 2.6 Renal Circulation -- 2.7 Conclusions -- Bibliography -- 3: Glomerular Filtration and Renal Blood Flow -- 3.1 Composition of Glomerular Filtrate -- 3.2 Dynamics of Glomerular Filtration -- 3.3 Renal Blood Flow -- 3.3.1 Autoregulation of Renal Blood Flow -- 3.3.2 Neurohumoral Regulation of Renal Blood Flow -- 3.4 Measurement of Glomerular Filtration Rate -- 3.4.1 Concept of Renal Clearance -- 3.4.2 Measuring Renal Plasma Flow (RPF)

-- 3.5 Conclusions -- Bibliography -- 4: Transport of NaCl, Organic Solutes, and Water in the Renal Tubule -- 4.1 Renal Function and Tubular Reabsorption -- 4.2 General Concepts of Transepithelial Transport -- 4.3 Bioenergetics of Sodium Transport and the Na<sup>+</sup>, K<sup>+</sup>-ATPase -- 4.4 Tubular Processes in Urine Formation -- 4.4.1 Proximal Tubule -- 4.5 Glucose Reabsorption. 4.6 Amino Acids and Proteins -- 4.7 Bicarbonate Reabsorption -- 4.8 Chloride Reabsorption -- 4.9 Secretion of Organic Anions and Cations -- 4.10 Coupling of Water Reabsorption with Solutes -- 4.11 Loop of Henle -- 4.12 Distal Nephron -- 4.13 Regulation of NaCl and Water Reabsorption Along the Nephron -- 4.13.1 Physical Factors: Starling Forces -- 4.13.2 Glomerulotubular Balance -- 4.13.3 Regulation by Neurotransmitters and Hormones: General Concepts -- 4.14 Conclusions -- Bibliography -- 5: Water Balance and the Regulation of Plasma Osmolality -- 5.1 Physical Basis of Water Transport -- 5.2 Water Pathways in the Cell Membrane and Regulation of Cell Volume -- 5.3 Distribution of Water in the Body -- 5.4 Whole Organism Water Balance -- 5.5 Determinants of Effective Plasma Osmolality -- 5.6 Biology of Arginine-Vasopressin -- 5.7 Regulation of Plasma Osmolality -- 5.8 Mechanism of Urinary Concentration and Dilution -- 5.8.1 Hypertonic Urine Formation -- 5.8.2 Hypoosmotic Urine Formation -- 5.8.3 Role of Vasa Recta Capillaries -- 5.9 Renal Handling of Urea -- 5.10 Quantification of the Kidney's Ability to Concentrate and Dilute Urine -- 5.11 Survival of Cells in High-Salinity Environments -- 5.12 Conclusions -- Bibliography -- 6: Osmoregulation in Non-mammalian Vertebrates -- 6.1 Fish -- 6.1.1 Teleosts -- 6.2 Elasmobranchs -- 6.3 Amphibians -- 6.4 Birds and Reptiles -- 6.5 Energy Cost of Osmoregulation in Aquatic Environments -- 6.6 Conclusions -- Bibliography -- 7: Regulation of the Effective Circulating Volume and the Sodium Balance -- 7.1 Concept and Determinants of the Circulating Volume -- 7.2 Sodium Balance and Its Relationship to Circulating Volume -- 7.3 Detection of Changes in Circulating Volume -- 7.4 Signals Generated from the Volume Receptors -- 7.4.1 Sympathetic Renal Innervation -- 7.4.2 Renin-Angiotensin II-Aldosterone Axis. 7.4.3 Atriopeptin -- 7.4.4 Arginine-Vasopressin -- 7.5 Control of Renal Sodium Excretion Under Euvolemic Conditions -- 7.6 Control of Renal Sodium Excretion in Hypovolemia -- 7.7 Control of Renal Sodium Excretion Under Conditions of Hypervolemia -- 7.8 Edema -- 7.9 Conclusions -- Bibliography -- 8: Renal Regulation of Acid-Base Balance -- 8.1 Body Acid-Base Balance -- 8.2 Buffers in the Body -- 8.3 Physiology of the CO<sub>2</sub>-Bicarbonate Buffer -- 8.4 Renal Regulation of Acid-Base Balance -- 8.4.1 Bicarbonate Reabsorption Along the Nephron -- 8.4.2 Bicarbonate Regeneration -- 8.5 Regulation of Acid-Base Transport by the State of the Acid-Base Balance -- 8.6 Primary Acid-Base Balance Disorders -- 8.6.1 Metabolic Acidosis -- 8.6.2 Metabolic Alkalosis -- 8.6.3 Respiratory Acidosis -- 8.6.4 Respiratory Alkalosis -- 8.7 Conclusions -- Bibliography -- 9: Potassium Balance Regulation -- 9.1 Distribution of the K<sup>+</sup> in the Body -- 9.2 Transmembrane Distribution of K<sup>+</sup> -- 9.3 Internal Balance -- 9.4 External Balance -- 9.5 Adaptation to Potassium -- 9.6 Conclusions -- Bibliography -- 10: Tubular Transport of Calcium, Phosphate, and Magnesium -- 10.1 Role of the Ca<sup>++</sup> and Phosphate in the Body -- 10.2 Components of Total Calcium and Phosphate in Plasma -- 10.3 Tubular Transport of Calcium -- 10.4 Endocrine Regulation of Tubular Calcium Transport -- 10.5 Phosphate Tubular Transport -- 10.6 Endocrine Regulation of Phosphate Tubular Reabsorption -- 10.7 Conclusions -- Bibliography -- 11: Kidney Hormones and Their Action

-- 11.1 Renin-Angiotensin System -- 11.1.1 Function -- 11.1.2 Renal Location of RAS Components -- 11.1.3 Renin -- 11.1.4 Angiotensin I-Converting Enzyme (ACE), ACE2, and NEP 24.11 -- 11.1.5 Angiotensinogen -- 11.1.6 AT1 and AT2 Receptors -- 11.1.7 Mas Receptor -- 11.1.8 Pro-Renin Receptor -- 11.1.9 Ontogenia -- 11.2 Kallikrein-Kinin System.  
11.2.1 Functions -- 11.2.2 Renal Location of KKS Components -- 11.2.2.1 Kallikrein -- 11.2.2.2 Kininogens -- 11.2.2.3 B1 and B2 Receptors -- 11.2.3 KKS Ontogeny -- 11.3 Prostaglandins -- 11.3.1 Distribution of COX-1 in the Kidney -- 11.3.2 Distribution of COX-2 in the Kidney -- 11.4 Nitric Oxide -- 11.4.1 Distribution of NOS Isoforms in the Kidney -- 11.5 Erythropoietin -- 11.5.1 Location -- 11.5.2 Ontogeny -- 11.6 Conclusions -- Bibliography -- 12: Pathophysiology of Hypertension or High Blood Pressure -- 12.1 Sodium-Sensitive Hypertension and Kidney Hormones -- 12.2 Imbalance Between Vasoactive Hormones as a Mechanism of Renal Damage: Increase in ACE and Decrease in Kallikrein Alters t... -- 12.2.1 Local Induction of ACE and Progression of Kidney Disease -- 12.2.1.1 Importance of Tubulointerstitial Space -- 12.2.1.2 Is There a Common Mechanism for the Induction of ACE in Kidney Damage? -- 12.2.2 Deficiency of the Kallikrein-Kinin System and Kidney Damage -- 12.3 Regulation of Kallikrein Synthesis, Regulatory effect of Dietary Potassium -- 12.4 Importance of an Adequate Diet in Potassium and Its Natriuretic Effect -- 12.5 Sodium and Potassium in the Diet and Salt-Sensitive (Sodium) Hypertension -- 12.6 Importance of Renal Medullary Circulation in Sodium and Blood Pressure Regulation -- 12.7 Cyclooxygenase-2 -- 12.8 Conclusions -- Bibliography -- 13: Genetic Alterations of Tubular Transport of NaCl and Water -- 13.1 Bartter Syndrome -- 13.2 Gitelman Syndrome -- 13.3 Liddle Syndrome -- 13.4 Apparent Excess of Mineralocorticoid (AME) -- 13.5 Genetic Alterations of the Tubular Transport of Water -- 13.6 Diabetes Insipidus -- 13.7 Conclusions -- Bibliography -- 14: Answers to Chapter Questions -- Index.

---