Renal Physiology and Hydrosaline Metabolism

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Springer

EDICIONES UC

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The translation was done with the help of artificial intelligence (machine translation by the service DeepL.com). A subsequent human revision was done primarily in terms of content.

Translation from the Spanish language edition: Fisiología Renal y Metabolismo Hidrosalino. Segunda edición. By Pedro A. Gallardo and Carlos P. Vio. © Ediciones Universidad Católica de Chile, 2018. Original Publication ISBN 9789561422605. All rights reserved.

Jointly published with Ediciones Universidad Católica de Chile, Santiago. Original Spanish edition published by Ediciones Universidad Católica de Chile, Santiago, 2018.

ISBN 978-3-031-10255-4 ISBN 978-3-031-10256-1 (eBook)
https://doi.org/10.1007/978-3-031-10256-1

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Preface to the Second Edition

As the first edition, this second edition of *Renal Physiology and Hydrosaline Metabolism* is dedicated to medical and health sciences, and biology students as well as professional in these areas. This updated and revised edition in English is a translation of the second edition in Spanish, published by Ediciones UC. This title was selected by Springer Nature and Ediciones Universidad Católica to be translated and published in English. The authors are indebted to the publishers for this recognition and opportunity to reach a broader spectrum of readers.

Important advances in the field of renal physiology had occurred since the publishing of the first edition. In this second edition, we incorporated those advances in knowledge that we felt were important for students and professionals. Several chapters were rewritten to incorporate new relevant issues. For example, in Chap. 2, we included information on the molecular structure of the slit diaphragm junction and its relevance for the function of the glomerular filtration barrier. In Chap. 3, we included a discussion concerning the role of adenosine as a paracrine signal in tubuloglomerular feedback. We also included recent insights about the regulation of the function of the distal convoluted tubule and how this knowledge impacts the understanding of the regulation of potassium balance and regulation of effective circulating volume. We also included the anatomical base for the connecting tubule glomerular feedback (*CTGF)* in Chaps. 2 and 11. The importance of dietary potassium on sodium excretion, blood pressure regulation and prevention of cardiovascular diseases and hypertension, and public health regulations is highlighted in Chaps. 11 and 12. Chapter 13 is a new chapter concerning genetic alterations in tubular transport of Na^+, Cl^-, K^+, and water. We felt that this chapter was important for two reasons. First, it highlights the impact of molecular biology in understanding renal physiology. Second, from the pedagogical standpoint, the chapter underlines the relevance of specific proteins in the function of a given tubular segment. This is accomplished through the analysis of the impact of specific protein mutations in the function of the tubular segment and how this affects the function of downriver segments and whole electrolyte and water balance.

At the beginning of each chapter, the authors included a list of learning objectives that guide the reader about the goals of the chapter. At the end of each chapter, there is a list of review questions; the answer to each question requires the application of

specific contents in the chapter. All the answers to review questions are contained in Chap. 14.

Chapter 6 is devoted to biologists and to all students interested in osmoregulation in non- mammalian vertebrates. The authors felt that biologists should have a broader knowledge about osmoregulation than the study of the mammalian kidney.

We want to thank the overwhelming number of comments from medicine students from Pontificia Universidad Católica and Universidad Finis Terrae who encouraged us to write this second and updated edition, and to the Universidad San Sebastián.

We are deeply indebted to Mr. Carlos Céspedes for his invaluable help in reviewing the manuscript and figures and to Ms. Fernanda Carter for her valuable help. We also thank the artwork originally made by Fabiola Solari and enriched by Felipe Serrano.

Santiago, Chile

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Acknowledgments

We would like to thank Mr. Carlos Céspedes for his rigorous and professional review of the chapters and figures and Felipe Serrano (www.illustrative-science.com/) for vectorizing our draft figures.

This textbook *Renal Physiology and Hydrosaline Metabolism* has been funded in part by ANID (Agencia Nacional de Investigación y Desarrollo, Chile) to the Basal Centre of Excellence in Aging and Regeneration CARE (Grant PIA CONICYT ACE210009), and by a donation from SQM to the Basal Center CARE from the Pontificia Universidad Catolica de Chile.

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