Physiology (ISSN 1548-9213, ESSN 1548-9221) is published bimonthly (one volume per year) by the International Union of Physiological Sciences and the American Physiological Society. Subscription Price (U.S. dollars): Institutional print only, $210 U.S., $215 Canada and Mexico, $220 elsewhere; institutional online only, $180; nonmember individual print and online, $160 U.S., $165 Canada and Mexico, $170 elsewhere; nonmember individual online only, $120; members of IUPS-affiliated societies print and online, $160 U.S., $165 Canada and Mexico, $170 elsewhere; nonmember individual print and online, $145 U.S., $150 Canada and Mexico, $155 elsewhere; institutional online only, $180; nonmember individual print only, $145 U.S., $150 Canada and Mexico, $155 elsewhere; nonmember individual print and online, $160 U.S., $165 Canada and Mexico, $170 elsewhere; nonmember individual online only, $120; members of IUPS-affiliated societies print and online, $55.00, postpaid. Subscriptions are accepted on a calendar year basis only. Single Copies, Back Issues: when available $35.00 each, postpaid. Copyright © 2005 by the International Union of Physiological Sciences and the American Physiological Society.

Physiological Sciences and the American Physiological Society. Copyright © 2005 by the International Union of Physiological Sciences and the American Physiological Society.

Edited in cooperation with the International Union of Physiological Sciences.

Editor-in-Chief: Walter Boron, New Haven, CT
Associate Editors: Michael Caplan, New Haven, CT; Ulrich Pahl, Munich, Germany
Special Advisor: Gerhard Giebisch, New Haven, CT
Consulting Editors: Richard Aldrich, Stanford, CA; David Csapó, Boston, MA; Reiko Fitzsimonds, New Haven, CT; Stan Grillner, Stockholm, Sweden; Susan Hamilton, Houston, TX; Donald Hilgemann, Dallas, TX; Reinhard Jahn, Göttingen, Germany; Baruch Kanner, Jerusalem, Israel; Amira Klip, Toronto, Canada; Jennifer Lippincott-Schwartz, Bethesda, MD; José López-Bermejo, Seville, Spain; Peter Mayer-Abt, Zürich, Switzerland; Heini Murer, Zürich, Switzerland; Tullio Pozzan, Padua, Italy; William Sessa, New Haven, CT; Michael Walsh, Iowa City, IA
Editorial Coordinator: Charleen M Bertolini
APS Publications Office: M. Reich, Director of Publications; J. Darago, Journal Copy Editor
Art Direction, J/B Woolsey Arts, Inc.; Patrick Lane, Design and Illustration; John D. Woolsey, Art Development/Editing and Illustration; Kelly Paralis, Illustration
IUPS/APS Joint Managing Board: K. E. Barnett, Chair; Akimichi Kaneko; Ewa Szczepanska-Sadowska; Jimmy D. Neill; IUPS Treasurer
Editorial Board: Akimichi Kaneko, Zurich, Switzerland; Jennifer Lippincott-Schwartz, Bethesda, MD; José López-Bermejo, Seville, Spain; Michael Walsh, Iowa City, IA
James A. McCormick, Vivek Bhalla, Alan C. Pao, and David Pearce

How Does the Kidney Filter Plasma? 96
Karl Tryggvason and Jornna Wattarova
The podocyte slit diaphragm plays a central role in glomerular filtration.

Ion Channels in Mesangial Cells: Function, Malfunction, or Fiction 102
Rong Ma, Jennifer L. Pluznick, and Steven C. Sansom
A variety of mesangial cell ion channels have been recognized, but few have been studied in detail. Many may represent adaptations to specific cell culture conditions, and their possible functional roles in vivo need to be defined.

The Genetics of Heteromeric Amino Acid Transporters 112
Manuel Palacín, Virginia Nunes, Mariona Font-Llitjós, Maite Jiménez-Vidal, Joana Fort, Emma Gasol, Maria Pineda, Lidia Feliubadaló, Josep Chillarón, and Antonio Zorzano
The molecular bases of phenylketonuria, lysinuric protein intolerance, and Hartnup disorder are revealing the mechanisms of amino acid renal and intestinal reabsorption in mammals.

Molecular Physiology of Urate Transport 125
Matthias A. Hediger, Richard J Johnson, Hiroki Miyazaki, and Hitoshi Endou
Recently identified human urate transporters are thought to play a central role in uric acid homeostasis.

SGK1: A Rapid Aldosterone-Induced Regulator of Renal Sodium Reabsorption 134
James A. McCormick, Vivek Bhalla, Alan C. Pao, and David Pearce
The serine-threonine kinase SGK1 has been identified as a key mediator of renal sodium reabsorption through the epithelial sodium channel.

The Protein Tyrosine Kinase-Dependent Pathway 140
Dong-Hoong Lin, Hyacinth Sterling, and Wen-Hui Wang
Decreases in K intake stimulate, whereas increases in K uptake suppress, the expression of protein tyrosine kinases in the kidney.

REVIEWS

...