

# American Journal of Physiology: Renal, Fluid and Electrolyte Physiology

Editor: K. A. HRUSKA

---

**Associate Editors:**

R. J. ALPERN  
W. J. ARENDSHORST  
R. C. BLANTZ

J. V. BONVENTRE  
T. DANIEL  
L. L. HAMM III  
M. R. HAMMERMAN

A. R. MORRISON  
R. G. O'NEIL  
S. OPARIL  
B. A. STANTON

---

**Editorial Board:**

S. ALPER  
D. A. AUSIELLO  
B. J. BALLERMANN  
P. BARRETT  
M. G. BAUM  
P. D. BELL  
T. BERL  
C. A. BERRY  
J. E. BOURDEAU  
P. C. BRAZY  
J. BRIGGS  
J. C. BURNETT, JR.  
M. G. COGAN  
V. W. DENNIS  
G. F. DiBONA  
J. DOUGLAS  
T. DUBOSE  
M. J. DUNN  
P. A. FRIEDMAN

S. L. GLUCK  
D. GOOD  
R. GRAY  
S. GULLANS  
S. C. HEBERT  
T. H. HOSTETTER  
D. HUMES  
J. INGELFINGER  
P. A. INSEL  
W. KEANE  
K. L. KIRK  
S. KLAHR  
M. KNEPPER  
B. M. KOEPPEN  
J. I. KREISBERG  
R. KUMAR  
I. KURTZ  
D. J. MARSH  
K. MARTIN

T. D. MCKINNEY  
B. MOLITORIS  
R. A. NISSENSON  
M. S. PALLER  
S. SANSOM  
D. SCHLONDORFF  
J. SCHNERMANN  
A. SCHOOLWERTH  
V. L. SCHUSTER  
G. SCHWARTZ  
S. SHAH  
P. SILVA  
K. SKORECKI  
E. SLATOPOLSKY  
J. STOKES  
R. L. TANNEN  
G. TOBACK  
A. S. VERKMAN  
J. WEINBERG  
M. WOLGAST

---

**Publications Committee**

J. S. COOK, *Chair*  
F. M. ABOUD  
M. J. FREGLY  
C. M. TIPTON  
S. H. WHITE

*Ex officio*

B. B. RAUNER  
*Publications Manager  
and Executive Editor*  
V. S. BISHOP, *President*  
M. FRANK, *Executive Dir.*

*Editorial Staff*

L. CHAMBERS  
*Production Manager*  
  
K. CANNON  
*Copy Editor*

---

Address all editorial  
and business correspondence to:

AMERICAN JOURNAL  
OF PHYSIOLOGY  
9650 Rockville Pike,  
Bethesda, MD 20814

The *American Journal of Physiology: Renal, Fluid and Electrolyte Physiology* (ISSN-0363-6127) is published monthly (two volumes a year) by the American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814. *Subscription Price:* \$190.00 per year postpaid, U.S.; \$225.00, elsewhere. Subscriptions from outside the United

States are payable in U.S. Currency or full equivalent. Japanese yen price is available from our agent: USACO Corporation, 13-12 Shim-bashi 1-Chome, Minato-Ku, Tokyo 105, Japan. Subscriptions are accepted on a calendar-year basis only. *Single Copies and Back Issues:* When available, \$30.00 each postpaid. Second-class postage paid at Bethesda, MD and at additional mailing offices. POSTMASTER: send address changes to the American Journal of Physiology: Renal, Fluid and Electrolyte Physiology, 9650 Rockville Pike, Bethesda, MD 20814.

Copyright © 1989 by the American Physiological Society. Printed in the United States of America. The

code at the bottom of the first page of an article indicates the copyright owner's consent that copies of that article may be made beyond that permitted by sections 107 and 108 of the U. S. Copyright Law—unless the copies are for general distribution, for advertising, for creating new works, or for resale—provided the per-copy fee is paid through the Copyright Clearance Center, Inc., 27 Congress St., Salem, MA 01970. 0363-6127/89 \$1.50.

*Change of Address:* The Journal must be advised of a change of address at least 6 weeks prior to date of issue, with both the subscriber's old and new address given. Undelivered copies resulting from address change will not be replaced.