

American Journal of Physiology- Regulatory, Integrative and Comparative Physiology

Editor: C. D. SIGMUND

Associate Editors:

W. K. SAMSON (Deputy)
A. K. JOHNSON
U. C. KOPP

M. KLINGENSPOR
B. E. LEVIN
H. NISHIMURA

Q. J. PITTMAN
D. M. POLLOCK
C. D. SLADEK

Consulting Editor: P. B. PERSSON S. K. POWERS

Medical Consulting Editors:

A. L. MARK

F. C. LUFT

Editorial Board:

B. T. ALEXANDER
A. M. ALLEN
T. J. BARTNESS
M. BARTON
C. BAYLIS
S. L. BEALER
D. D. BELSHAM
H.-R. BERTHOUD
P. BIE
M. W. BRANDS
E. J. BRAUN
V. L. BROOKS
J. G. CANNON
K. CARON
L. A. CASSIS
M. W. CHAPLEAU
S. CHEMTOB
D. CLEGG
M. A. COWLEY
J. T. CUNNINGHAM
W. A. CUPPLES
R. A. L. DAMPNEY
R. L. DAVISSON
G. E. DE SOUZA
M. DI RIENZO
J. R. DIETZ
P. D'ORLEANS-JUSTE
A. J. DOUGLAS
H. EHMKE
D. H. EVANS
J. FANDREY
A. V. FERGUSON
F. W. FLYNN

J. C. FRISBEE
J. L. GARVIN
M. GASSMANN
R. GERSTBERGER
A. Y. GRACEY
J. P. GRANGER
G. H. GREELEY
O. GRISK
K. W. GROSS
K. L. GROVE
P. G. GUYENET
R. B. S. HARRIS
P. J. HAVEL
C. HINOJOSA-LARBORDE
Y. HIROOKA
N.-H. HOLSTEIN-RATHLOU
J. D. IMIG
B. IVERSEN
D. C. JACKSON
S. E. JACOBS-KAUFMAN
B. J. A. JANSSEN
B. L. JENSEN
E. J. JOHNS
J. JORDAN
P. JOSE
C. JULIEN
A. JUST
H. KEEN
R. A. KHALIL
H. R. KIRCHHEIM
C. M. KOTZ
A. KURTZ
F. C. LANG

A. LAWRENCE
T. E. LOHMEIER
C. LORETZ
G. N. LUHESHI
S. MARTIN
D. L. MATTSO
R. MCALLEN
M. J. MCKINLEY
D. MILLER
J.-P. MONTANI
T. H. MORAN
S. F. MORRISON
M. NIKINMAA
B. OLDFIELD
K. OLSON
S. E. OZANNE
G. PARATI
A. PATZAK
P. M. PILOWSKY
J. S. POLLOCK
J. B. PRITCHARD
H. RAFF
K. RAHMOUNI
M. K. RAIZADA
D. C. RANDALL
J. F. RECKELHOFF
R. D. REIDELBERGER
J. L. RENFRO
R. RETTIG
L. M. RINAMAN
R. A. ROBERGS
R. J. ROMAN
A. A. ROMANOVSKY

M. G. ROSS
J. ROTH
T. RUF
M. J. RYAN
F. J. SALAZAR
H. SAPRU
M. N. SAWKA
H. D. SCHULTZ
C. SCHNACKENBERG
J. SCHNERMANN
A. M. SCHREIHOFFER
H. SCHOLZ
J. L. SEGAR
O. SKÖTT
R. S. SPRAGUE
H. STAUSS
D. W. STEPP
E. M. STRICKER
A. F. SVED
D. B. THOMASON
G. M. TONEY
J. H. URBAN
A. J. M. VERBERNE
A. G. WATTS
S. W. WATTS
R. S. WEISINGER
W. J. WELCH
L. L. WOODS
J. M. WYSS
Y. YOSHIDA
T. T. ZITTEL
I. H. ZUCKER

Publications Committee

K. E. BARRETT, *Chair*
D. GUTTERMAN
P. MASON
P. PERSSON
J. SANDS

Ex officio

M. REICH
*Director of Publications
and Executive Editor*
H. CAREY, *President*
M. FRANK, *Executive Director*

M. L. GOODWIN

Editorial Manager
B. A. RUDE
Journal Supervisor
L. KANASKIE
Copy Editor

The *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology* (ISSN-0363-6119) is published monthly (two volumes a year) by the American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991 and online at www.ajpregu.org (ISSN 1522-1490). *Subscription Prices (postpaid)*: Institutions (print and online): \$720.00, US; \$790.00, Canada and Mexico; \$815.00, elsewhere. Institutions (print only): \$700.00, US; \$770.00, Canada and Mexico; \$795.00, elsewhere. Institutions (online only): \$595.00. Nonmember individual (print and online): \$480.00, US; \$550.00, Canada and Mexico; \$575.00, elsewhere. Nonmember individual (print only): \$465.00, US; \$535.00, Canada and Mexico; \$560.00, elsewhere. Nonmember individual (online only): \$400.00. APS member (print only and online is free): \$180.00, US; \$250.00, Canada and Mexico; \$275.00, else-

where. Subscriptions from outside the United States are payable in US currency or full equivalent. Subscriptions are accepted on a calendar-year basis only. *Single Copies and Back Issues*: When available, \$35.00 subscriber and \$70.00 nonsubscriber each postpaid. Periodicals postage paid at Bethesda, MD and at additional mailing offices. POSTMASTER: Send address changes to the American Journal of Physiology-Regulatory, Integrative and Comparative Physiology, 9650 Rockville Pike, Bethesda, MD 20814-3991.

Copyright © 2008 by the American Physiological Society. Printed in the United States of America by Cadmus Communications—Lancaster Division, Lancaster, PA 17601. 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 US 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., 222 Rosewood Dr., Danvers, MA 01923. 0363-6119/2008 \$8.00.

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.

Editorial and Business Correspondence: AJP-Regulatory, Integrative and Comparative Physiology, 9650 Rockville Pike, Bethesda, MD 20814-3991.