

JOURNAL OF APPLIED PHYSIOLOGY

Editor: J. DEMPSEY

Associate Editors:

A. DE TROYER	S. GUNST	C. O'DONNELL	G. THOMAS
R. FREGOSI	J. HAGBERG	E. RICHTER	D. WASSERMAN
S. GANDEVIA	R. MOORE	D. SEALS	J. WOJTASZEWSKI
R. GLENNY			

Feature Editors: M. J. JOYNER G. C. SIECK

Consulting Editors:

M. HARGREAVES	L. ROWELL	B. SALTIN
---------------	-----------	-----------

International Advisory Board:

I. HOMMA, <i>Japan</i>	P. ROBBINS, <i>United Kingdom</i>	T. YAO, <i>People's Republic of China</i>
F. LEHMANN-HORN, <i>Germany</i>		

Editorial Board:

T. G. BABB	J. J. FREDBERG	M. I. LEWIS	C. A. RAY
K. M. BALDWIN	E. B. GAUDA	M. LIU	M. B. REID
M. M. BAMMAN	L. G. GOODYEAR	R. LYDIC	M. N. SAWKA
T. J. BARSTOW	D. GOZAL	G. S. LYNCH	P. T. SCHUMACKER
J. H. T. BATES	J. R. HALLIWILL	G. W. MACK	N. H. SECHER
K. C. BECK	M. T. HAMILTON	S. MAGDER	J. G. SEMMLER
D. C. BOLSER	Z. HANTOS	R. J. MARTIN	C. K. SEN
F. W. BOOTH	C. A. HARMS	D. R. MCCRIMMON	C. Y. SEOW
A. M. BORIEK	M. A. HAXHIU	M. J. MCKENNA	D. D. SHERIFF
G. A. BROOKS	E. J. HENRIKSEN	R. A. MEYER	J. K. SHOEMAKER
R. H. BROWN	M. P. HLASTALA	V. M. MILLER	P. D. SLY
V. BRUSASCO	D. A. HOOD	C. T. MINSON	C. A. SMITH
N. CHARKOUDIAN	S. R. HOPKINS	G. S. MITCHELL	N. L. STEPHENS
T. L. CLANTON	S. N. A. HUSSAIN	W. MITZNER	N. L. STROHL
P. S. CLIFFORD	C. G. IRVIN	B. J. MORGAN	K. P. STROHL
R. K. CONLEE	S. ISONO	T. L. MUSCH	B. SUKI
E. F. COYLE	G. A. IWAMOTO	E. E. NATTIE	H. I. TANAKA
C. G. CRANDALL	J. M. JOHNSON	J. NEUBAUER	A. E. TAYLOR
K. P. DAVY	K. A. JONES	D. S. O'LEARY	J. A. TAYLOR
J. B. DEAN	M. P. KAUFMAN	B. K. PEDERSEN	S. R. TAYLOR
M. D. DELP	W. M. KOHRT	W. J. PERKINS	B. THACH
F. A. DINNENNO	J. M. KOWALCHUK	M. I. POLKEY	C. M. TIPTON
G. L. DOHM	W. J. KRAEMER	D. C. POOLE	A. TSUDA
P. R. EASTWOOD	K. C. KREGEL	S. K. POWERS	A. A. VANDERVOORT
R. M. ENOKA	S. LAHIRI	N. R. PRABHAKAR	E. M. WAGNER
W. B. FARQUHAR	S. J. LAI-FOOK	Y. S. PRAKASH	P. D. WAGNER
M. A. FEBBRAIO	M. H. LAUGHLIN	D. N. PROCTOR	D. O. WARNER
M. FLESHNER	L.-Y. LEE	B. B. RASMUSSEN	W. W. WINDER
H. V. FORSTER	B. D. LEVINE	P. B. RAVEN	W.-Z. ZHAN

Publications Committee

K. E. BARRETT, *Chair*
E. M. HASSER
M. F. KAGNOFF
M. A. KNEPPER
R. L. TERJUNG

Ex officio

M. REICH
*Director of Publications
and Executive Editor*
D. C. EATON, *President*
M. FRANK, *Executive Director*

M. L. GOODWIN

Editorial Manager
V. MILLION
Journal Supervisor
S. BOYER, R. FREEHLING,
E. KESTNBAUM
Copy Editors

The *Journal of Applied Physiology* (ISSN-8750-7587) is published monthly (two volumes per year) by the American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991 and online at www.jap.org (ISSN 1522-1601). *Subscription Prices (postpaid)*. Institutional (print and online): \$1,140, US; \$1,190, Canada & Mexico; \$1,240, elsewhere. Institutional (print only): \$1,090, US; \$1,140, Canada & Mexico; \$1,190, elsewhere. Institutional (online only): \$935. Nonmember individual (print and online): \$760, US; \$810, Canada & Mexico; \$860, elsewhere. Nonmember individual (print only): \$725, US; \$775, Canada & Mexico; \$825, elsewhere. Nonmember individual (online only): \$625. APS Members (print and online): \$325, US; \$375, Canada & Mexico; \$425, elsewhere.

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: Back Issues:* When available, \$100.00 each postpaid. Periodicals postage paid at Bethesda, MD and at additional mailing offices. POSTMASTER: Send address changes to the *Journal of Applied Physiology*, 9650 Rockville Pike, Bethesda, MD 20814-3991.

Copyright © 2006 by the American Physiological Society. Printed in the United States of America by Cadmus Professional Communications—Ephrata Division, Ephrata, PA 17522. 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. 8750-7587/06 \$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: *Journal of Applied Physiology*, 9650 Rockville Pike, Bethesda, MD 20814-3991.