The Journal of Applied Physiology (ISSN-8750-7587) is published online twice monthly and bound once in print 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). Subscriptions to print and online pricing, please see http://www.the-aps.org/publications/subs/. Individual Pricing: Print and Online: $1,075 US; $1,170 International. Print Only: $1,040 US; $1,145 International. Online Only: $895. APS members: Online is $895. APS members: Print Only is $1,040 US; $1,145 International. APS members: Print and Online is $1,075 US; $1,170 International.

Copyright © 2013 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., 22 Rosewood Dr., Danvers, MA 01923.

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.

Editor: Peter D. Wagner

Associate Editors:
Keith Baar
Esther Barreiro
Jason Bates
Sue Bodine

George Brooks
Christopher DeSouza
Ralph Fregosi

Simon Gandevia
Marla Hopman
Kevin Kregel
M. Harold Laughlin

Judith Neubauer
David Poole
Anemie Schols

Consulting Editors:
Hannah V. Carey
Jerome A. Dempsey
Susan J. Gust
Mark Hargreaves
Hans Hoppeker

Michael J. Joyner
Bente Kiers
Fabiola Leon-Velarde
Michiaki Mishima
Wayne Mitdener

Jens Bo Nielsen
Michael B. Reid
Michael N. Sawka
Gary C. Stieck
Muriel Thoby-Brisson

Trainee Advisory Consulting Editor:
Shawn Bender

Editorial Board:
Gregory R. Adams
Philip A. Antle
David L. Allen
Bill T. Anderson
Keith Baar
Tom G. Bab
E. Festa Bailey
Christopher P. Baines
Marcus M. Bamman
Thomas J. Barlow
Donald Bartlett, Jr.
David B. Bassett, Jr.
Kenneth C. Beck
Bradley J. Behnke
George E. Billman
Donald G. Bolster
Frank W. Boshoff
Robert H. Brown
Vito Brunaco
Mark Butler
James P. Buiter
Jane E. Butler
Timothy John Carroll
James A. Castor
Gregory D. Carter
Nina L. L. Chambers
Nishi Chandrakan
Samuel N. Cheesew
Thomas L. Clanton
Philip C. Clifford
Andrew R. Coggan
Robert H. Coker
Timothy E. Concoran
James D. Cotter
Edward F. Coyle
Craig G. Crandall
Theodore DeSouza
Warren L. DeWeese
Donna D. DeWitt
Deirdre D. Duerksen
Jill A. Ebert
Lori J. Dacour

Ester E. Dugger-Ventegagen
Price H. Eastwood Robinson
David G. Edwards
Matthew W. Edridge
Craig A. Enterline
Paul J. Finkel
Dano Farina
William B. Faquher
Harbin V. Frontera
Patrick T. Fitzgibbon
David D. Fultz
Paul R. Gallagher
Joseph H. Geisler
Rae M. Geisler
Karyn L. Hamilton
Julian Hems
Craig A. Harms
John A. Hargens
Robert D. Herbert
Lacy A. Holloszy
Suan Roberts Hopkins
Connie C. W. Hils
Bero D. Hubmayr
Sandra K. Hunter
Sabah A. Husein
Charles G. Ivins
Shirko Iwan
Gary J. Iwamoto
John M. Johnson
Andrew M. Jones
Amy S. Jordan
Max P. Kastor
Wendy M. Kohut
John P. Kontula
John M. Korczuk
William J. Kramer
Maike Krentz
France Lapu
Lydia S. Lazo
Lu-Yuan Lee
Robert S. Lee-Young
James C. Leiter
Lisa R. Leon
Benjamin D. Levine
Doug Lonnen
Jose A. Lopez-Calbet
Stephen H. Long
Richard M. Longvick
Caronie Lundy
Sheldon Magder
Francis Malina
Jason H. Martinik
Glenn R. McCullough
Timothy J. McDonough
Kerry S. McDonald
David Kenneth Meltzer
William McMaster
Chris J. McNeil
Christopher Todd Minson
Gordon S. Mitchell
Betina Mitaloefler
S稹nos Miklasz
Scott J. Monteith
Mary M. Muller-Stall
Timothy J. Musch
Robert Naege
Enrique E. Nattie
P. Darrell Neufour
David C. Nieman
Timothy I. Musch
Larry M. Myers-Delp
Timothy J. Musch
Robert Nace
Enrique E. Nattie
P. Darrell Neufour
David C. Nieman
Mark J. Nyberg
Donal S. O'Leary
Donald S. O'Leary
U. Mark Oliff
Stuart C. Phillips
Veselad V. Polkosky
Scott K. Powers
Nandini Prabhakar
Robert W. Putnam
Blake B. Rasmussen
Christopher J. Mathews
J. Andrew Taylor
Richard M. Lovering
Lisa R. Leon
James C. Leiter

Publications Committee
Hershel Raff, Chair
William M. Chilian
Susan J. Gust
Asrar M. Malik
Joseph Mark Metzger
David M. Pollock
Linda C. Samuelson

Ex officio
Rita Scherman
Director of Publications and Executive Editor
Kim E. Barrett, President
Martin Frank, Executive Director
Mark L. Goodwin
Editorial Manager
Virginia Million
Journal Supervisor
Gordon D. Cartee
Pei Review Manager
Erik Richard Swenson
Rita Scherman
Robert S. Zepper
Bradley T. Thach
Gabrielle Todd
Alaska Toole
John V. Thyberg
Marc L. Uri
Alain Van Mylen
Sylvia A. B. Verhoek
Isiteng Vujicic
Theodore J. Wilson
Bret J. Young
Christopher R. Woodman

Eric Pesaneli
Editorial Art Manager
Lisa Richter
Editor’s Assistant

Disclaimer: The statements and opinions contained in the articles of The Journal of Applied Physiology are solely those of the individual authors and contributors and not of the American Physiological Society. The appearance of advertisements in the journal is not a warranty, endorsement, or approval of the products or their use. The American Physiological Society disclaims responsibility for any injury to persons or property resulting from any ideas or products referred to in any article or advertisement.