Editor: P. Kay Lund

Deputy Editor: Denise M. Ney

Associate Editors:
David Adams
Claudio Fiocchi
Andrew Giraud
Craig Logsdon
Karnam Murthy
Detlef Schuppan
Terez Shea-Donohue

Editorial Board:
Hamid I. Akbarali
David H. Alpers
Gianfranco Alpini
Nadia A. Arnaot
Shrikant Anant
Gregory W. Aponte
Minoo Apte
Takashi Azuma
Graham S. Baldwin
Giovanni Barbara
Donatella Barisani
Nick Barker
Kim E. Barrett
Charles L. Bevins
L. A. Blackshaw
Kirsteen Browning
Nigel W. Bunnett
Douglas G. Burrin
Michael Carulli
Hannah V. Carpy
Nicholas J. Clemmons
Sean P. Colgan
Christopher M. Dekaney
Timothy L. Deming
Lee A. Denson
Shengji Ding
Jonathan A. Dranoff
Pradeep K. Dudeja
Lars Eckmann
Gianrico Farrugia
Ronald P. Ferraris
Mark R. Frey
James I. Galligan
Bin Gao
Lara R. Gawenis
Andrew T. Gewirtz
Sadig K. Ghosh
Gregory J. Gores
D. Neil Granger
John R. Grider
Guy E. Groblewski
Ajay S. Gulati
Sanjeev Gupta
Kathryn Hamilton
Karen M. Hannett
Michael A. Helmarath
Louise M. Judd
Peter J. Kahrlas
Takanori Kanai
Jonathan D. Kaufman
Stephen J. Keely
Salim Khakoo
Kimberly S. Kirkwood
Jan-Michael A. Klappmeyer
John F. Kuenzlerle
Sushash Kulkarni
Andrew B. Leiter
Markus M. Lerch
Robin Lorenz
Sophie Loberzetzgaj
Thomas T. MacDonald
Bryan Mackenzie
Wallace K. Macnaughton
Scott T. Magness
Fabio Marra
Declan F. McCole
Michael A. McCuekin
Trevylyn R. Menheniott
Didier Merlin
Jason C. Mills
Revinder K. Mittal
Satendarshan (Paul) S. Monga
Marshall H. Montrose
Roderigo Mora
Laura E. Nagy
Andrew Neish
Markus Neurath
Amanda J. Page
Stephen J. Pandol
Richard M. Peek
Massimo Pinzani
Klaas Poelesstra
Daniel Poole
Yury Popov
Charalabos Pothoulakis
Elizabeth Powell
David M. Pritchard
Satish Rao
Satish Rattan
Eyal Raz
Rachael J. Rigby
Deborah C. Rubin
Hamid M. Said
Ashok K. Sabjia
Linda C. Samuelson
Jorg D. Schulzke
Robert Schwabe
Vijay H. Shah
Le Shen
Shamshu Srinivasan
William F. Stenson
Mario Strazzabosco
Philip Sutton
Mark G. Swain
Wing-kin Syn
Yvette F. Tache
Frank Tacke
Cormac T. Taylor
Ariane L. Theiss
Herbert Tilg
Andrea Todisco
R. Alberto Travagl
Jerrold R. Turner
John Wallace
Jian-Ying Wang
Sean M. Ward
Christopher R. Weber
David C. Whitcomb
John A. Williams
Gary D. Wu
Zhao-Qiu Wu
Vincent W. Yang
C. C. Yun
Yana Zavvos
Thomas R. Ziegler

Publications Committee
Hershel Raff, Chair
Susan J. Gunst
Alicia A. McDonough
Joseph Mark Metzger
Linda C. Samuelson
Susan M. Wall

Ex officio
Rita Scheman
Director of Publications and Executive Editor
David M. Pollock, President
Martin Frank, Executive Director

Mark L. Goodwin
Editorial Manager
Ellyn Kestnbaum
Journal Supervisor

Gilbert Ehner
Peer Review Manager
Jami Jones
Peer Review Coordinator
Eric Pesanelli
Editorial Art Manager
Josh Robbs
Editor’s Assistant

The American Journal of Physiology-Gastrointestinal and Liver Physiology (ISSN-0193-1857) is published twice monthly online at www.ajpgi.org (two volumes a year) by the American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991 (ISSN 1522-1547). Subscription Prices (post-paid): For institutional print and online pricing, please see http://www.the-aps.org/publications/subs. Nonmember individual subscriptions (online only) $420.00. APS members: online is free. Subscriptions from outside the United States are payable in US currency or full equivalent. Subscriptions are accepted on a calendar-year basis only. Print back issues, when available, through December 2011: Subscribers, $40 each; Nonsubscribers, $75. Periodicals postage paid at Bethesda, MD and at additional mailing offices.

The American Journal of Physiology-Gastrointestinal and Liver Physiology® is a registered trademark of the American Physiological Society.

Copyright © 2014 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.

Editorial and Business Correspondence: AJP-Gastrointestinal and Liver Physiology, 9650 Rockville Pike, Bethesda, MD 20814-3991.

Disclaimer: The statements and opinions contained in the articles of the American Journal of Physiology-Gastrointestinal and Liver 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 safety. 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.