

The Journal of Pharmacology and Experimental Therapeutics

A Publication of the American Society for Pharmacology and Experimental Therapeutics

Founded by John J. Abel - 1908

Michael F. Jarvis, Editor

Keith Glaser, Assistant Editor

ASSOCIATE EDITORS

| | | | | |
|----------------------|------------------|----------------------|--------------------|---------------------|
| Darrell R. Abernethy | David A. Gewirtz | Lawrence H. Lash | James M. O'Donnell | Kenneth D. Tew |
| Ian Adcock | Alan R. Gintzler | Roberto Levi | Bryan L. Roth | David Weinschenker |
| Arthur Christopoulos | Yuichi Hattori | Philip R. Mayeux | Robert A. Roth | Michael Williams |
| Salvatore Cuzzocrea | Ronald N. Hines | David S. Miller | Roland Seifert | Raymond J. Winquist |
| Giora Z. Feuerstein | Raouf A. Khalil | Richard A. Morrisett | Domenico Spina | Benjamin Yerxa |
| Mitchell P. Fink | Rohini Kuner | | | |

EDITORIAL ADVISORY BOARD

| | | | | |
|----------------------|--------------------|------------------------|----------------------|----------------------|
| Geoffrey W. Abbott | Brian M. Cox | Garrett J. Gross | Mark J. Millan | Federico Sesti |
| Thomas J. Abbruscato | Bryan F. Cox | Perry V. Halushka | Virginia Miller | Patrick Sexton |
| Peter Abel | Brian Cummings | Gyorgy Hasko | Giorgio Minotti | Shivendra D. Shukla |
| Edson X. Albuquerque | Ann Daly | Derek Hausenloy | Hitoshi Morikawa | David R. Sibley |
| Bradley Andresen | M. Imad Damaj | Paul Heerd | Hasan Mukhtar | Theodore A. Slotkin |
| Thomas M. Argentieri | William C. deGroat | Susanna Hourani | S. Jamal Mustafa | Philip C. Smith |
| Reto Asmis | Russell Delude | Leonard L. Howell | Michael Nader | Nikolai M. Soldatov |
| John Auchampach | Patrick Dougherty | Dale G. Hoyt | S. Stevens Negus III | Patricia K. Sonsalla |
| Bork Balkan | Grant Drummond | John Imig | Kim A. Neve | Michael D. Southall |
| Amy Banes-Berceli | Andrea Eckhart | Edwin K. Jackson | Yasuyuki Nomura | Roger D. Speelman |
| William A. Banks | Frederick J. Ehler | Douglas Johns | James S. Norris | Francis G. Spinale |
| Bjoern Bauer | John L. Evenden | Kenneth M. Johnson | Grazyna Nowak | Douglas Sweet |
| Reina Bendayan | Alessandro Fatatis | William J. Jusko | Patricio O'Donnell | Milt Teitler |
| Jack Bergman | Steven J. Feinmark | Peter W. Kalivas | Nazareno Paolucci | Alvin V. Terry |
| Daniel C. Bertrand | Stephen F. Flaim | Mark R. Kelley | Achilles J. Pappano | Myron L. Toews |
| Italo Biaggioni | Anthony W. Fox | Lewis B. Kinter | B. Kevin Park | George J. Trachte |
| Mark A. Birrell | Gert Fricker | Thomas Kocarek | Sandra Pfister | Hiroshi Ueda |
| Floyd E. Bloom | Ryan Fryer | Wouter Koek | Russell O. Pieper | Ellen Walker |
| Jean-Marie Boeynaems | Hiroyuki Fukui | George F. Koob | Russell A. Prough | Sandra P. Welch |
| Franco Borsini | James J. Galligan | Suk-Hee Lee | Raymond M. Quock | Daniel Wierda |
| Robert Brock | Vadivel Ganapathy | Richard Lock | Fabio Recchia | Jeffrey M. Witkin |
| Marco Brotto | Patricia E. Ganey | Benedict R. Lucchesi | J. Larry Renfro | Bryan K. Yamamoto |
| Nancy Brown | Kathy Gauthier | Joseph J. Lynch | Richard Rothman | |
| Qin Chen | Gary Gintant | Lee Ann MacMillan-Crow | Jonathan G. Scammell | |
| Jon Corton | John R. Glowa | Gerard Marek | Michal Laniado | |
| Lucio G. Costa | Steven M. Grassl | Rosalinde Masereeuw | Schwartzman | |

BOARD OF PUBLICATIONS TRUSTEES

James E. Barrett, *Chair*; P. Jeffrey Conn, Randy A. Hall, Michael F. Jarvis, Eric F. Johnson, Kathryn E. Meier, Kim A. Neve, David R. Sibley, Mary Vore, and Jeffrey M. Witkin

ASPET EXECUTIVE OFFICER: Christine K. Carrico

Journals Director: Richard Dodenhoff

Managing Editor: Jill Filler

Editorial Coordinator: Cassie Wood

Journal and ASPET office: 9650 Rockville Pike, Bethesda, MD 20814-3995; telephone: 301-634-7060; fax: 301-634-7061; email: info@aspet.org; Web site: www.aspet.org; journal web site: jpet.aspetjournals.org.

Editorial matters should be addressed to Dr. Michael F. Jarvis, Editor, *The Journal of Pharmacology and Experimental Therapeutics*, at the above address.

Official version: The online version of *The Journal of Pharmacology and Experimental Therapeutics* contains all of the information and material contained in the print version plus additional material that may not appear in print such as videos and large data sets. The online version may be more current than the print version. Where noted, the online version has been corrected in departure from the print version. The online version of *The Journal of Pharmacology and Experimental Therapeutics* officially published by the American Society for Pharmacology and Experimental Therapeutics is the definitive version and, to the extent any difference exists, will prevail over the print version.

Instructions to Authors: See jpet.aspetjournals.org for the Instructions to Authors, the ASPET Authorship Responsibility, Financial Disclosure, and Chemical Structure Statement form, and the Copyright Transfer form.

Subscriptions: Contact the ASPET Subscriptions Dept., 9650 Rockville Pike, Bethesda, MD 20814-3995; telephone: 301-634-7782; fax: 301-634-7061; email: subscriptions@aspet.org. For multi-site and consortia sales in Europe, contact: David Charles, eLicensing, 92 avenue du Général de Gaulle, 78600, Maisons-Laffitte, France; telephone: +33-1-39-12-29-29; fax: +33-1-39-12-47-45; email: dc.Elicensing@orange.fr.

Change of address: ASPET must be notified 60 days in advance. Copies undeliverable because of incorrect address will be destroyed. Duplicate copies may be obtained, if available, from ASPET at the single copy price. Send address changes to the ASPET office.

Issue replacement policy: *Domestic subscribers*—Claims for nondelivery of issues must be made within three (3) months of issue mail date. *Foreign subscribers*—Claims for nondelivery of issues must be made within six (6)

months of issue mail date. **Missing Issues (domestic and foreign)**—ASPET will not honor refunds or replacement requests made outside of the claim time period. Up to two (2) issues will be replaced free of charge per subscription year.

Reprints in large quantities for commercial or academic use may be purchased from ASPET. For information and prices, call 301-634-7063.

Copyright information: *The Journal of Pharmacology and Experimental Therapeutics* is copyrighted by the American Society for Pharmacology and Experimental Therapeutics. For permission to photocopy or use material electronically from *The Journal of Pharmacology and Experimental Therapeutics*, see www.copyright.com or contact the Copyright Clearance Center (CCC), Inc., 222 Rosewood Dr., Danvers, MA 01923; telephone: 978-750-8400. Photocopying of articles beyond that permitted by Sections 107 and 108 of the U.S. Copyright Law is allowed, provided that the \$25.00-per-copy fee is paid through the CCC. Classroom photocopying is permitted at no fee, provided that students are not charged more than the cost of duplication. This consent does not extend to other kinds of copying. Reproduction of any portion of an article for subsequent republication requires permission of ASPET. Write to the ASPET office at the above address. Requests should include a statement of intended use as well as explicit specifications of the materials to be reproduced.

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

Copyright © 2011 by the American Society for Pharmacology and Experimental Therapeutics. All rights reserved. Printed in the U.S.A.