

# PHARMACOLOGICAL REVIEWS

A Publication of the American Society for Pharmacology and Experimental Therapeutics

Louis S. Goodman, Founding Editor, 1949

## David R. Sibley, Editor

### ASSOCIATE EDITORS

Stephen P. Alexander  
Nottingham, United Kingdom  
Dan Ingemar Andersson  
Uppsala, Sweden  
Eric Barker  
West Lafayette, Indiana  
Jack Bergman  
Belmont, Massachusetts  
Arthur Christopoulos  
Clayton, Australia  
Lynette Daws  
San Antonio, Texas  
Béatrice Desvergne  
Lausanne, Switzerland  
Annette Dolphin  
London, United Kingdom  
Timothy Esbenshade  
Abbott Park, Illinois

Bertil Fredholm  
Stockholm, Sweden  
Christopher J. Garland  
Oxford, United Kingdom  
Glenda E. Gillies  
London, United Kingdom  
Michael Gottesman  
Bethesda, Maryland  
Paul A. Insel  
La Jolla, California  
Yoshihiro Ishikawa  
Yokohama, Japan  
Markku Koulu  
Turku, Finland  
Finn Olav Levy  
Oslo, Norway  
Dan L. Longo  
Baltimore, Maryland

Qiang Ma  
Morgantown, West Virginia  
Mark P. Mattson  
Baltimore, Maryland  
Howard L. McLeod  
Chapel Hill, North Carolina  
Martin Michel  
Ingelheim, Germany  
A. Leslie Morrow  
Chapel Hill, North Carolina  
Michael Nader  
Winston-Salem, North Carolina  
Kevin Niswender  
Nashville, Tennessee

Eliot Ohlstein  
Glenmore, Pennsylvania  
Clive Page  
London, United Kingdom  
Dianne Perez  
Cleveland, Ohio  
Michael G. Rosenblum  
Houston, Texas  
Emily Scott  
Lawrence, Kansas  
Theresa Shapiro  
Baltimore, Maryland  
Burt Sharp  
Memphis, Tennessee  
Ulf Simonsen  
Trige, Denmark  
Rhian M. Touyz  
Glasgow, United Kingdom

### ASPET BOARD OF PUBLICATIONS TRUSTEES

James E. Barrett, Chair; Randy A. Hall, Michael F. Jarvis, Kathryn E. Meier, Edward T. Morgan, Kim A. Neve, David R. Sibley, Stephen F. Traynelis, and Jeffrey M. Witkin

ASPET EXECUTIVE OFFICER: Christine K. Carrico

JOURNALS DIRECTOR: Richard Dodenhoff

MANAGING EDITOR: Jill Filler

Editorial supervision of *Pharmacological Reviews* is shared jointly with the British Pharmacological Society and the Scandinavian Pharmacological Societies.

*Pharmacological Reviews* (ISSN 1521-0081) is published quarterly in January, April, July, and October online only by the American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, MD 20814-3995. E-mail: [subscriptions@aspet.org](mailto:subscriptions@aspet.org). ASPET web site: [aspet.org](http://aspet.org). Journal web site: [pharmrev.aspetjournals.org](http://pharmrev.aspetjournals.org). Subscription rates at [aspetjournals.org/site/subscriptions/index.xhtml](http://aspetjournals.org/site/subscriptions/index.xhtml). GST Tax Number for Canadian subscribers: BN:13489 2330 RT. Indexed or abstracted by: *Biological Abstracts*, *BIOSIS Previews Database*, *Biosciences Information Service*, *Current Contents*®/*Life Sciences*, *EMBASE/Excerpta Medica*, *Index Medicus*, *Index to Scientific Reviews*®, *Medical Documentation Service*®, *Reference Update*®, *Research Alerts*®, *Science Citation Index*®, and *SciSearch*®. Journal and ASPET office: 9650 Rockville Pike, Bethesda, MD 20814-3995. Telephone: 301-634-7060. Fax: 301-634-7061. E-mail: [info@aspet.org](mailto:info@aspet.org). ASPET web site: [aspet.org](http://aspet.org). Journal web site: [pharmrev.aspetjournals.org](http://pharmrev.aspetjournals.org).

Editorial matters should be addressed to Dr. David R. Sibley, Editor, *Pharmacological Reviews*, at the above address.

**Instructions to Authors:** See [pharmrev.aspetjournals.org](http://pharmrev.aspetjournals.org) for the Instructions to Authors and the ASPET Copyright Transfer and Authorship Responsibility, Financial Disclosure, and Chemical Structure Statement forms.

**Subscriptions:** Contact the ASPET Subscriptions Dept., 9650 Rockville Pike, Bethesda, MD 20814-3995. Telephone: 301-634-7782. Fax: 301-634-7061. E-mail: [subscriptions@aspet.org](mailto:subscriptions@aspet.org). See [aspetjournals.org/site/subscriptions/index.xhtml](http://aspetjournals.org/site/subscriptions/index.xhtml) for rates.

**Change of IP addresses:** ASPET will help institutional subscription administrators update IP address ranges as requested. Subscription administrators can make these changes at the journal site using their account user name and password.

**Reprints of individual articles** are available from the journal web site using the pay-per-view option for nonsubscribers.

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

**Copyright information:** *Pharmacological Reviews* is copyrighted by the American Society for Pharmacology and Experimental Therapeutics. For permission to photocopy entire articles from *Pharmacological Reviews*, see [www.copyright.com](http://www.copyright.com) or contact the Copyright Clearance Center (CCC), Inc., 222 Rosewood Dr., Danvers, MA 01923. Telephone: 978-750-8400. For permission to reprint portions of articles such as figures and tables or to reprint entire articles in a thesis or dissertation, see [www.aspet.org/webforms.aspx?ekfrm=84](http://www.aspet.org/webforms.aspx?ekfrm=84). Photocopying or printing 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.

**Disclaimer:** The statements and opinions contained in the articles of *Pharmacological Reviews* 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** © 2012 by the American Society for Pharmacology and Experimental Therapeutics. All rights reserved.