

# PHARMACOLOGICAL REVIEWS

A Publication of the American Society for Pharmacology and Experimental Therapeutics

Louis S. Goodman, Founding Editor, 1949

**Lynette C. Daws, Editor**

## ASSOCIATE EDITORS

Stephen P. Alexander  
Nottingham, United Kingdom

Robert Dantzer  
Houston, Texas

Charles France  
San Antonio, Texas

Michael Gottesman  
Bethesda, Maryland

Jukka Hakola  
Oulu, Finland

Birgitte Holst  
Copenhagen, Denmark

Vivian Hook  
San Diego, California

Paul A. Insel  
La Jolla, California

Yoshihiro Ishikawa  
Yokohama, Japan

Hyunyoung (Young) Jeong  
Chicago, Illinois

Habibeh Khoshbouei  
Gainesville, Florida

Finn Olav Levy  
Oslo, Norway

Martin Michel  
Ingelheim, Germany

Michael Nader  
Winston-Salem,  
North Carolina

Eliot Ohlstein  
Glenmore,  
Pennsylvania

Clive Page  
London, United Kingdom

Amin Rostami-Hodjegan  
Manchester, United Kingdom

Nancy R. Rusch  
Little Rock, Arkansas

John D. Schuetz  
Memphis, Tennessee

Gunnar Schulte  
Stockholm, Sweden

Ulf Simonsen  
Trige, Denmark

Rhian M. Touyz  
Glasgow, United Kingdom

Richard D. Ye  
Shanghai, China

## PUBLICATIONS COMMITTEE

Laura Bohn, Lynette Daws, Xinxin Ding, Beverley Greenwood-Van Meerveld, Michael F. Jarvis, J. Steven Leeder, Adriano Marchese, Kathryn E. Meier, Gary O. Rankin, Susan Wood; and Mohamed Ghonim, *ex officio* Young Scientist Representative

**ASPET EXECUTIVE OFFICER:** Dave Jackson

**PUBLICATIONS DIRECTOR:** Maria Pasho

**SR. JOURNAL OPERATIONS MANAGER:** Jacqueline Perry

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, 1801 Rockville Pike, Suite 210, Rockville, MD 20852-1633. E-mail: 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:** 1801 Rockville Pike, Suite 210, Rockville, MD 20852-1633. 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 Lyn Daws, Editor, *Pharmacological Reviews*, at [pharmrev@aspet.org](mailto:pharmrev@aspet.org).

**Instructions to Authors:** See [pharmrev.aspetjournals.org](http://pharmrev.aspetjournals.org) for the Instructions to Authors and information on ASPET Authorship Responsibility, Financial Disclosure, and Chemical Structure policies.

**Subscriptions:** Contact the ASPET Subscriptions Dept., 1801 Rockville Pike, Suite 210, Rockville, MD 20852-1633. 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 <https://www.aspet.org/aspet/journals/journals-information/permissions-request>. Photocopying or printing articles beyond that permitted by Sections 107 and 108 of the U.S. Copyright Law is allowed, provided that the \$35.00-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** © 2022 by the American Society for Pharmacology and Experimental Therapeutics. All rights reserved.