# 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**

Hamid I. Akbarali Virginia Commonwealth Univ.

Stephen P. Alexander University of Nottingham,

Andrew Baker

University of Edinburgh, UK Michelle Glass Matthew Banks

Virginia Commonwealth Univ.

Erin Calipari Vanderbilt Univ.

**Mattias Carlstrom** Karolinska Inst., Sweden

A.H. Jan Danser Erasmus MC, Netherlands

Robert Dantzer Univ. of Texas Kay Double

Univ. of Sydney, Australia

Qatar Univ., Qatar

Charles France

Univ. of Texas Health Science Ctr.

Dunedin, New Zealand

Michael Gottesman NCI, NIH

Thomas Gudermann LMU Munich, Germany

Grace Guo Rutgers Univ.

Jukka Hakkola

Univ. of Oulu, Finland Hyunyoung (Young) Jeong

Purdue Univ.

Habibeh Khoshbouei Univ. of Florida Volker Lauschke

Karolinska Inst., Sweden Francesca Levi-Schaffer

The Hebrew Univ. of Jerusalem, Israel

Finn Olav Levy Univ. of Oslo, Norway Sara Liin

Linkoping Univ., Sweden Martin Michel

Johannes Gutenberg Univ., Germany

Eliot Ohlstein Drexel Univ.

Clive Page

King's College London, UK Des R. Richardson

Griffith University

Rebecca Ritchie

Monash Inst., Australia John D. Schuetz

St. Jude's Children's Research Hospital

Gunnar Schulte

Karolinska Inst., Sweden

Ulf Simonsen

Aarhus Univ., Denmark

Harald Sitte

Medical Univ. Vienna, Austria Barbara Stauch Slusher

Johns Hopkins University

Rhian M. Touyz

McGill Univ., Canada

Joanne Wang

Univ. of Washington

Richard Ye

The Chinese Univ. of Hong Kong, China

### **SOCIAL MEDIA AMBASSADORS**

Nina Beltran Univ. of Texas, El Paso

Öykü Deniz Beşe AnkaraÜniversitesi, Turkey

Katie-Marie Case King's College London, United Kingdom

Mahan Gholam Azad Kimberly Holter Griffith Univ., Australia

Vanderbilt Univ., Nashville

Joseph Miller St. Jude's Children's Research Hospital, Arlington

#### **PUBLICATIONS COMMITTEE**

Kenneth D. Tew, Chair; Laura Bohn, Lynette Daws, Xinxin Ding, Beverley Greenwood-Van Meerveld, Michael F. Jarvis, Adriano Marchese, Gary O. Rankin, John J.G. Tesmer, Susan Wood, Ai-Ming Yu; and Mohamed Ghonim, ex officio Young Scientist Representative

## **ASPET EXECUTIVE OFFICER:** Dave Jackson

Publications Director: Maria Pasho Journal Operations Manager: Tracey Kirkbride Peer Review Coordinator: Kristine Styron

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 bimonthly in January, March, May, July, September, and November 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. Journal web site: pharmrev.aspetjournals.org. Subscription rates at 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<sup>®</sup>, Medical Documentation Service<sup>®</sup>, Reference Update<sup>®</sup>, Research Alerts<sup>®</sup>, Science Citation Index<sup>®</sup>, and SciSearch<sup>®</sup>. Journal and ASPET office: 1801 Rockville Pike, Suite 210, Rockville, MD 20852-1633. Telephone: 301-634-7060. Fax: 301-634-7061. E-mail: pharmrev@aspet.org. ASPET web site: aspet.org. Journal web site: pharmrev.aspetjournals.org.

Editorial matters should be addressed to Lyn Daws, Editor, Pharmacological Reviews, at pharmrev@aspet.org.

Instructions to Authors: See 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. See 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 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 © 2024 by the American Society for Pharmacology and Experimental Therapeutics. All rights reserved.