

# MOLECULAR PHARMACOLOGY

A Publication of the American Society for Pharmacology and Experimental Therapeutics

Founded by Avram Goldstein—1965

**John J. G. Tesmer, Editor**

Martin Michel, Deputy Editor

## ASSOCIATE EDITORS

Raymond Evers, John R. Hepler, Sridhar Mani,  
Andrew Morris, Manojkumar Puthenveedu, and Alan Smrcka

Adriano Marchese, *Minireview Editor*

David Gewirtz, *Emerging Concepts Editor*

Martin Michel, Harvey J. Motulsky, *Statistics Editors*

## EDITORIAL AND ADVISORY BOARD

Katerina Akassoglou	George Dubyak	Miwako Kato Homma	Henry Lester	Michael A. Rogawski
Giuseppe Battaglia	Frederick J. Ehler	Nato Hoshi	Lian Li	Bryan L. Roth
Jeffrey L. Benovic	Michael Freissmuth	Kenneth A. Jacobson	Angeline M. Lyon	Gunnar Schulte
Nigel J. M. Birdsall	Liwu Fu	Andrew Jenkins	Ken Mackie	Shivendra V. Singh
Laura Bohn	Aurelio Galli	Eric F. Johnson	Adriano Marchese	Gregory Tall
Wendy Bollag	Adolfo García-Sáinz	Mathew Jones	James O. McNamara	Andrew Tobin
Joan Heller Brown	Ulrik Gether	Marcelo Kazanietz	Laurence J. Miller	John Traynor
Moritz Bunemann	Alisa Glukhova	John Kehrl	Graeme Milligan	JoAnn Trejo
Thomas Burris	Frank J. Gonzalez	Terry Kenakin	Ole Valente Mortensen	Joanne Wang
Jennifer Cash	Michael M. Gottesman	Brian K. Kobilka	Senthil Natesan	David J. Waxman
William A. Catterall	Patrick Griffin	Evi Kostenis	Richard R. Neubig	Jurgen Wess
Niels Decher	Grace Guo	Rakesh Kukreja	Kim A. Neve	Wen Xie
Mark Dell'Acqua	J. Silvio Gutkind	Nevin Lambert	Eric Ortlund	Richard D. Ye
Jerod Denton	Randy A. Hall	Philip Lazarus	Rennolds S. Ostrom	Lixia Yue
Lakshmi Devi	Kasper Hansen	L. M. Fredrik	Jean-Philippe Pin	Michael Zhu
Henrik Dohlman	Donald Hilgemann	Leeb-Lundberg	Cheryl Rockwell	

## 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 *Senior Journals Operations Manager*: Jacqueline Perry *Peer Review Coordinator*: Suzanne Cholwek

**Molecular Pharmacology** (ISSN 1521-0111) is published monthly online only (two volumes per year beginning in January and July) by the American Society for Pharmacology and Experimental Therapeutics, 1801 Rockville Pike, Suite 210, Rockville, MD 20852-1633. E-mail: [subscriptions@aspet.org](mailto:subscriptions@aspet.org). ASPET web site: [aspet.org](http://aspet.org). Journalweb site: [molpharm.aspetjournals.org](http://molpharm.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:** *Biochemistry & Biophysics Citation Index*®, *Biological Abstracts*, *Current Awareness in Biological Sciences*, *Current Contents*®/*Life Sciences*, *EMBASE/Excerpta Medica*, *Index Medicus*, *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: [molpharm.aspetjournals.org](http://molpharm.aspetjournals.org).

**Editorial matters** should be addressed to Dr. John J. G. Tesmer Editor, *Molecular Pharmacology*, at [molpharm@aspet.org](mailto:molpharm@aspet.org).

**Instructions to Authors:** See [molpharm.aspetjournals.org](http://molpharm.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:** *Molecular Pharmacology* is copyrighted by the American Society for Pharmacology and Experimental Therapeutics. All permissions requests are processed through the Copyright Clearance Center (CCC), Inc. at <https://www.copyright.com/get-permissions>. 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 *Molecular Pharmacology* 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** © 2023 by the American Society for Pharmacology and Experimental Therapeutics. All rights reserved.