

# PHARMACOLOGY BIOCHEMISTRY AND BEHAVIOR

Editor-in-Chief

MATTHEW J. WAYNER

Division of Life Sciences, The University of Texas at San Antonio, San Antonio, Texas 78285

## Editorial Advisory Board

ROBERT L. BALSTER, Virginia Commonwealth University, Richmond, VA  
BERNARD BEER, Medical Research Division of American Cyanamid, Pearl River, NY  
ROBERT J. BLANCHARD, University of Hawaii at Manoa, Honolulu, HI  
ALLAN C. COLLINS, University of Colorado at Boulder, Boulder, CO  
DONALD V. COSCINA, Clark Institute of Psychiatry, Toronto, Ontario, Canada  
JACQUELINE N. CRAWLEY, Department of Health & Human Services, Bethesda, MD  
ADRIAN J. DUNN, Louisiana State University, Shreveport, LA  
BURR EICHELMAN, University of North Carolina at Chapel Hill, Raleigh, NC  
JOHN L. FALK, State University of New Jersey, Rutgers, New Brunswick, NJ  
SANDRA E. FILE, University of London, London, U.K.  
WILLIAM J. FREED, National Institute of Mental Health, Washington, DC  
RICHARD A. GLENNON, Virginia Commonwealth University, Richmond, VA  
A. J. GOUDIE, The University of Liverpool, Liverpool, U.K.  
M. R. C. GREENWOOD, Vassar College, Poughkeepsie, NY  
ROLAND R. GRIFFITHS, The Johns Hopkins University School of Medicine, Baltimore, MD  
J. HANO, Polish Academy of Sciences, Krakow, Poland  
STEPHEN G. HOLTZMAN, Emory University School of Medicine, Atlanta, GA  
AKIRA HORITA, University of Washington, Seattle, WA  
WALTER A. HUNT, Armed Forces Radiobiology Research Institute, Bethesda, MD  
JOSEPH P. HUSTON, University of Dusseldorf, Dusseldorf, West Germany  
CHRIS E. JOHANSON, Uniformed Services University of the Health Sciences, Bethesda, MD  
HAROLD KALANT, University of Toronto, Toronto, Ontario, Canada  
G. JEAN KANT, Walter Reed Army Institute of Research, Washington, DC

KATHLEEN M. KANTAK, Boston University, Boston, MA  
ABBA J. KASTIN, Veterans Administration Medical Center, New Orleans, LA  
GEORGE F. KOOB, Research Institute of Scripps Clinic, La Jolla, CA  
CONAN KORNETSKY, Boston University Medical Center, Boston, MA  
J. DAVID LEANDER, Lilly Research Laboratories, Indianapolis, IN  
ALLEN S. LEVINE, Veterans Administration Medical Center, Minneapolis, MN  
WILLIAM J. McBRIDE, Indiana University School of Medicine, Indianapolis, IN  
DONALD E. McMILLAN, University of Arkansas for Medical Sciences, Little Rock, AR  
H. MATTHIES, Medizinische Akademie Magdeburg, Magdeburg, DDR  
JACK H. MENDELSON, Harvard Medical School, Belmont, MA  
FATHY S. MESSIHA, University of North Dakota, Grand Forks, ND  
LAURENCE R. MEYERSON, Ramapo College of New Jersey, Mahwah, NJ  
LAWRENCE D. MIDDGAUGH, Medical University of South Carolina, Charleston, SC  
ROBERT D. MYERS, East Carolina University School of Medicine, Greenville, NC  
KIM T. NG, LaTrobe University, Bundoora, Victoria, Australia  
JAAK PANKSEPP, Bowling Green State University, Bowling Green, OH  
JOHN A. ROSECRANS, Virginia Commonwealth University, Richmond, VA  
HERMAN H. SAMSON, University of Washington, Seattle, WA  
PAUL R. SANBERG, University of Cincinnati Medical Center, Cincinnati, OH  
DAVID S. SEGAL, University of California, San Diego, La Jolla, CA  
PHIL SKOLNICK, Department of Health & Human Services, Bethesda, MD  
DEREK VAN DER KOOY, University of Toronto, Toronto, Ontario, Canada  
JEANNE M. WEHNER, University of Colorado, Boulder, Boulder, CO  
J. C. WINTER, State University of New York, Buffalo, Buffalo, NY  
ALICE M. YOUNG, Wayne State University, Detroit, MI  
IAN S. ZAGON, M. S. Hershey Medical Center, Hershey, PA

## PHARMACOLOGY BIOCHEMISTRY & BEHAVIOR

### Editorial Offices:

Matthew J. Wayner

Division of Life Sciences, The University of Texas at San Antonio, San Antonio, Texas 78285

### Publishing, Subscription and Advertising Offices:

Maxwell Pergamon Macmillan, Inc., Fairview Park, Elmsford, NY 10523, USA;  
and Maxwell Pergamon Macmillan plc, Headington Hill Hall, Oxford OX3 0BW, England

### Published Monthly

Annual institutional subscription rate (1989): DM1640.00;

Two-year institutional subscription rate (1989/90): DM3116.00;

Personal subscription rate for those whose libraries subscribe at the regular rate (1989): DM190.00.

Prices are subject to change without notice.

Notify 8 weeks in advance of address change with a copy of the subscription mailing label.

*Back issues:* Back issues of all previously published volumes, in both hard copy and on microform, are available direct from Maxwell Pergamon Macmillan offices.

Pharmacology Biochemistry & Behavior (ISSN 0091-3057) is published monthly by Maxwell Pergamon Macmillan.

Second class postage paid at Elmsford, NY, and additional mailing offices.

Postmaster: Send address changes to: Pharmacology Biochemistry & Behavior, Maxwell Pergamon Macmillan, Fairview Park, Elmsford, NY 10523

COPYRIGHT © 1989 Maxwell Pergamon Macmillan plc

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

### Photocopying Information for Users in the USA

The Item-Fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law is paid. The appropriate remittance of \$3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970. *Permission for other use.* The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying. Please contact the Subsidiary Rights Manager at either Maxwell Pergamon Macmillan, Inc. or Maxwell Pergamon Macmillan plc.

The Item-Fee Code for this publication is:

0091-3057/89 \$3.00 + .00