

# PHARMACOLOGICAL REVIEWS

- Jerry J. Buccafusco**  
THE ROLE OF CENTRAL CHOLINERGIC NEURONS IN THE  
REGULATION OF BLOOD PRESSURE AND IN  
EXPERIMENTAL HYPERTENSION..... 179
- Asrar B. Malik and Siu K. Lo**  
VASCULAR ENDOTHELIAL ADHESION MOLECULES AND  
TISSUE INFLAMMATION..... 213
- Owen P. Hamill and Don W. McBride, Jr.**  
THE PHARMACOLOGY OF MECHANOGATED MEMBRANE  
ION CHANNELS..... 231
- David Bell and Barbara J. McDermott**  
CALCITONIN GENE-RELATED PEPTIDE IN THE  
CARDIOVASCULAR SYSTEM: CHARACTERIZATION  
OF RECEPTOR POPULATIONS AND THEIR  
(PATHO)PHYSIOLOGICAL SIGNIFICANCE..... 253
- Jack C. Dacre and Max Goldman**  
TOXICOLOGY AND PHARMACOLOGY OF THE CHEMICAL  
WARFARE AGENT SULFUR MUSTARD..... 289
- Hyman Engelberg**  
ACTIONS OF HEPARIN IN THE ATHEROSCLEROTIC  
PROCESS..... 327



# PHARMACOLOGICAL REVIEWS

## INFORMATION FOR SUBSCRIBERS

**PHARMACOLOGICAL REVIEWS** (PTS/ISSN 0031-6997) is an official publication of The American Society for Pharmacology and Experimental Therapeutics and is published by Williams & Wilkins, 351 West Camden Street, Baltimore, MD 21201-2436. Periodicals postage paid at Baltimore, MD, and at additional mailing offices. CPC IPM #0060186. POSTMASTER: Send address changes to PHARMACOLOGICAL REVIEWS, 351 West Camden Street, Baltimore, MD 21201-2436.

**Frequency:** *Quarterly*: One volume a year beginning in March.

**Correspondence concerning business matters should be addressed to:** Customer Service, Subscriptions, Williams & Wilkins, 351 West Camden Street, Baltimore, MD 21201-2436. Telephone 1-800-638-6423 from anywhere in the U.S. and Canada. From other countries, call (410) 528-8555. Fax: (410) 528-8596.

**Correspondence regarding editorial matters should be addressed to the Editor:** David B. Bylund, Ph.D., Department of Pharmacology, University of Nebraska Medical Center, 600 South 42nd Street, Omaha, NE 68198-6260. Telephone: (402) 559-4788. Fax: (402) 559-7495. E-mail: DBYLUND@UNMC.EDU.

**For information on Society membership, contact:** The American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, MD 20814. Telephone: (301) 530-7060 Fax: (301) 530-7061.

**Instructions to Authors** appear in every issue.

**Annual Subscription Rates:** U.S.: *Personal* \$65.00; *Institutional* \$115.00; *Single copy* \$31.00. **Outside the U.S., except for Japan:** *Personal* \$85.00; *Institutional* \$135.00; *Single copy* \$36.00.

**Special in-training rate** of \$50.00 (\$70.00 outside the U.S.) per year is available to residents, interns, and students for a period of 3 years. When requesting this rate, please indicate training status and name of institution. This special in-training rate can be extended to all participants in 4-year training programs, provided that sufficient proof of training status is supplied.

**Institutional (multiple reader) rate** applies to libraries, schools, hospitals, clinics, group practices, and federal, commercial, and private institutions and organizations.

**For Japanese rates, please contact:** Igaku-Shoin MYW Ltd., 3-23-14 Hongo, Bunkyo-Ku, Tokyo 113, JAPAN. Telephone: (03) 5689-5400 or 5401. Fax: (03) 5689-5402.

PRICES ARE SUBJECT TO CHANGE.

The GST number for Canadian subscribers is 123394371. Country of origin USA.

**New subscriptions** received before May 1 of each year will begin with the first issue of the year. Subscriptions received between May 1 and October 31 will start with the mid-year issue (September). Subscriptions received after October 31 will start with the first issue of the following year. Subscriptions may start with any current volume's issue upon request.

**Renewals** should be done *promptly* to avoid a break in journal delivery. The Publisher cannot guarantee to supply back issues on late renewals.

**Change of address:** The publisher must be notified 60 days in advance. Journals undeliverable because of incorrect address will be destroyed. Duplicate copies may be obtained, if available, from the Publisher at the regular price of a single issue. Send address changes to PHARMACOLOGICAL REVIEWS, 351 West Camden Street, Baltimore, MD 21201-2436. If a member, please contact the Society with your change.

**Reprints of individual articles** are available only from authors. If authors need information on their reprint order, call the Reprint Department at (410) 528-4000 or (800) 882-0483.

**Reprints in large quantities (non-authors)**, for commercial or academic use, may be purchased from the Publisher. For information and prices, call (410) 528-4000 or (800) 882-0483.

**Microfilm and Microfiche:** Prices are available upon request. Microfilm editions may be ordered from Williams & Wilkins.

**The Journal subscription list** is available for rental on a controlled basis from Williams & Wilkins. All promotional literature must be approved in advance.

**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 or Williams & Wilkins. The appearance of advertisements in the Journal is not a warranty, endorsement, or approval of the products or safety. The American Society for Pharmacology and Experimental Therapeutics and the Publisher disclaim responsibility for any injury to persons or property resulting from any ideas or products referred to in the articles or advertisements.

**Volume index** appears in the December issue.

**Indexing/Abstracting Services:** The Journal is currently included by the following services in print and/or electronic format: *Index Medicus*, *Current Contents (Life Sciences, Index to Scientific Reviews, Science Citation Index, Research Alert [personalized search service], ISI/BioMed on-line database), Excerpta Medica, Biosciences Information Service, and Reference Update/Research Information Systems.*

**Copyright Information:** PHARMACOLOGICAL REVIEWS is copyrighted by the American Society for Pharmacology and Experimental Therapeutics. No portion(s) of the work(s) may be reproduced without written consent from Williams & Wilkins. Permission to reproduce copies of articles for non-commercial use may be obtained from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (508) 750-8400, with a fee of \$3.00 per copy.

Copyright © 1996 by The American Society for Pharmacology and Experimental Therapeutics.

# PHARMACOLOGICAL REVIEWS

## SUGGESTIONS TO CONTRIBUTORS

Papers to be published in *Pharmacological Reviews* are, for the most part, invited by the Editor after consideration of recommendations from the Associate Editors and other consultants and evaluation of outlines and statements of central theme submitted by the prospective authors. Others who have an interest in writing for *Pharmacological Reviews* are also encouraged to send proposals to the Editor. After submission of the manuscript, it is reviewed by three or more experts in the field and, depending on their comments, revisions may be requested.

Articles in *Pharmacological Reviews* deal mainly with the current status of the subject under review. They are to be written clearly and concisely and should be intelligible to nonspecialists, with definitions of unfamiliar technical terms and explanations of difficult or controversial points included. At the same time, the review is to be sufficiently precise and detailed to command the attention and respect of experts in the field. Selective rather than exhaustive coverage of the literature is requested. Previous reviews of the subject and of related fields should be cited. Authors are asked to be critical of methods, results, and conclusions and to challenge accepted concepts where warranted. Conflicting points of view are to be presented objectively in good perspective. Deficiencies in the field may be pointed out and avenues for further work may be indicated.

When an invitation to write a review is accepted, the author is asked to estimate the time when the manuscript will be submitted. If it becomes necessary to extend the original deadline, the author should notify the Editor immediately and set a new deadline. Authors also are requested to provide the Editor with an estimate of the length of the review article. The usual length ranges between 12 and 50 printed pages, corresponding to about 40 to 150 manuscript pages.

Diagrams, tables, and, occasionally, illustrations may be included if necessary to bring out new concepts and important relationships, or when access by the reader to original sources would be unusually difficult.

Reference works used by the Editor for definitions, usage, spelling, and punctuation are as follows:

Webster's Ninth New Collegiate Dictionary, G. & C. Merriam Co., Springfield, 1985.

Webster's Third New International Dictionary, G. & C. Merriam Co., Springfield, 1986.

The Concise Oxford Dictionary, 7th ed., ed. by J. B. Sykes, Oxford University Press, Oxford, 1982.

Dorland's Illustrated Medical Dictionary, 26th ed., ed. by J. P. Friel, W. B. Saunders, Philadelphia, 1981.

CBE Style Manual Committee: CBE Style Manual: A Guide for Authors, Editors, and Publishers in the Biological Sciences, 5th ed., Council of Biology Editors, Inc., Bethesda, MD, 1983.

STRUNK, W., JR., AND WHITE, E. B.: *The Elements of Style*, 2nd ed., Macmillan, New York, 1979.

Manuscripts to be published in *Pharmacological Reviews* must be written in the English language. For words spelled differently in current American and British usage, authors may follow either usage but are asked to do so consistently throughout the manuscript.

Manuscripts are to be printed out from a computer, double-spaced, on white paper of good quality. The U.S.A. standard 8½- by 11-inch paper is preferred but the longer paper customarily used by authors from other countries is also acceptable. Each table is to be typed,

double-spaced, on a separate sheet of paper. Legends for figures, footnotes in the text, and references are also to begin on separate sheets, all lines double-spaced.

On first mention of an unfamiliar drug in the text of the article, it is desirable to give the official or generic (nonproprietary) name by which the drug is known in the U.S.A. or the country of origin of the manuscript. This may be followed by parentheses in which may appear official or generic names of the drug in other countries, selected familiar trade names, and the chemical name. (A diagram of the chemical structure shown in a figure often will be preferable to the spelled-out chemical name.) Example for a manuscript from the U.K.: "Thiopentone sodium, B.P. (Thiopental sodium, U.S.P.; Pentothal sodium)." Thereafter, the author may use whichever nonproprietary name is thought most suitable without giving synonyms. Similar considerations apply to non-standard abbreviations and acronyms. Standard abbreviations may be found in the CBE Style Manual or in *J. Biol. Chem.* **262**: 1-11, 1987.

Arabic numerals are used for all definite weights, measurements, percentages, and degrees of temperature. All weights, volumes, doses, etc., are to be given in metric units. Whenever possible, doses should be related to unit weight, surface area, or other standard. The concentrations of solutions may be indicated as normal, molar, or %. If percentages are used, a notation should be included to indicate whether strict percentage (w/w), % by volume (v/v), or a given weight of solute in 100 ml of solution (w/v) is intended. It is generally desirable to express quantities in units that give the closest approximation to unity, e.g., 0.5 mg and 1.5 g rather than 0.0005 g and 1500 mg. Abbreviations should conform to internationally accepted usage, viz., kg, g, mg, µg, l, ml, µl, m, cm, mm, µ, µm, Å, cm<sup>2</sup>, cm<sup>3</sup>, etc. For per cent the symbol % should be used.

Illustrations should be submitted in duplicate as unmounted glossy photographic prints, no larger than 8 by 10 inches. The authors' name and address, and the number of the figure should be placed on the back of each print. Illustrations must be clear enough to permit reproduction without retouching, and legibility after reduction to single-column size (approximately 3½ inches in width). Uniform symbolism should be used for all illustrations in a manuscript. Symbols, numbers, and letters in the illustrations must be at least 1.5 mm in height after reduction to single column size. The title of each figure should appear in the legend rather than on the figure itself. Photomicrographs and electron micrographs should be labeled with a magnification calibration in micro or Angstrom units. A statement of the magnification should appear in the figure legend.

References to the literature cited are to be grouped at the end of the manuscript under the heading REFERENCES. They are to be arranged in alphabetical order. The proper order is to be determined by the following rules, which are to be applied in the sequence listed:

1. Arrange the references alphabetically according to the last name of the first author.
2. If there are two or more first authors with identical last names, arrange alphabetically according to the first authors' initials.
3. References with coauthors are to follow those by the first author alone. Arrange them alphabetically according to the first coauthors' names. If there are two or more papers with the same first two authors, arrange alphabetically according to the second coauthors' names, etc.
4. If there are two or more references by the same author, or by the

## SUGGESTIONS TO CONTRIBUTORS

same sequence of authors, arrange according to date of publication, the earliest paper first; if the date of publication is the same, please add a lower case letter after each date both in the reference list and the text citation: 1995a, 1995b. References to "Unpublished observations" or to a "Personal communication" should be entered in the text in parentheses and omitted from the list of references.

Authors' names are to appear in the text in parentheses. Where two or more references are cited within the parentheses, they generally are placed in chronological order. Especially because these are review articles, it is essential that all references are cited correctly in text. Citations in text of some of the references listed below would appear as follows: (Starke and Schumann, 1973; DeGeest et al., 1979; Bojar, 1986). Text citations of different references with the same author(s) and year should include the same lower case letter with the year as appears in the reference list: (Starke and Schumann, 1973b; Bojar, 1986a, b). Contributors are expected to compare text citations with the bibliography to be sure that citations exactly match references listed and every reference is cited in the text. This comparison is to be completed before the final manuscript is submitted on diskette.

The bibliographic citations are to include names and initials of all authors, full title of the article in the original language, abbreviated name of the journal, full pagination, and year. Abbreviations for journals are to conform to those of Biosis List of Serials (from Biosciences Information Service of *Biological Abstracts*), modified by appropriate use of capital and lower case letters, accents, umlauts, and other diacritical marks.

Examples of references to books and chapters as well as to journal articles.

BACANER, M. B.: Treatment of ventricular fibrillation and other acute arrhythmias with bretylium tosylate. *Am. J. Cardiol.* **21**: 530-543, 1968.

BOJAR, H.: Quality control requirements in estrogen receptor determination. *Cancer Res. (suppl.)* **46**: 4249s-4255s, 1986.

BROWN, R. H., JR., AND NOBLE, D.: Effect of pH on ionic currents underlying pacemaker activity in cardiac Purkinje fibers. *J. Physiol. (Lond.)* **224**: 38P-39P, 1972.

BÜLBRING, E., AND TOMITA, T.: Catecholamine action on smooth muscle. *Pharmacol. Rev.* **39**: in press, 1987.

CRANFIELD, P. F.: The Conduction of the Cardiac Impulse, 404 pp., Futura Publishing Co., Mt. Kisco, NY, 1975.

DEGEEST, H., KESTELOOT, H., AND PIESENS, J. L.: Secondary prevention of ischemic heart disease: a long term controlled lidoflazine study. *Acta Cardiol. Suppl.* **24**: 1, 1979.

FLECKENSTEIN, A.: Experimental heart failure due to disturbances in high-energy phosphate metabolism. *In Proceedings of the Fifth European Congress of Cardiology, Athens, Sept. 1986*, pp. 255-269, 1968.

GODFRAIND, T., EGLEME, C., AND WIBO, M.: Effects of dihydropyridines on human and animal isolated vessels. *In Proceedings of "Bayer Symposia,"* ed. by A. Fleckenstein and C. Van Bree-man, vol. IX, pp. 309-325, Springer Verlag, Berlin, 1985.

STARKE, K., AND SCHUMANN, H. J.: Wirkung von nifedipine auf die funktion der sympathischen nerven des herzens. *Arzneim-Forsch.* **23**: 193-197, 1973.

WATANABE, Y.: Effects of electrolytes and antiarrhythmic drugs on atrioventricular conduction. *In Symposium on Cardiac Arrhythmias*, ed. by E. Sandøe, E. Flensted-Jensen, and K. H. Olesen, pp. 535-558, AB Astra, Södertälje, Sweden, 1970.

After Acceptance: When an article has been accepted for publication, authors will please submit the final manuscript on diskette. Software preference is XyWrite III Plus or Word Perfect version 4.2 or above with input media of 3½ or 5¼ diskettes. Please note, the above word processing program is our preference. However, we can accept diskettes created from other commonly used software programs. Two hard copies must accompany the diskette. This will expedite the publication process for Williams & Wilkins.

When submitting a final manuscript on diskette and after all required revisions have been made, please include:

- diskette (3½ or 5¼ inch)
- 2 hard copies of the manuscript (8½ × 11) double spaced
- the name of the software program and version, e.g., Word Perfect/4.2.

Authors of published reviews receive jointly 50 reprints free of charge. Additional reprints may be ordered at the time of publication. A reprint order form will be enclosed with the proof of each article. Questions regarding reprint orders may be directed to the Reprint Department of the Publisher by calling (410) 528-4000 or (800) 882-0483.

THE EDITOR