The Journal of Pharmacology and Experimental Therapeutics

A Publication of The American Society for Pharmacology and Experimental Therapeutics
Founded by John J. Abel – 1909

Edited for the Society by John A. Harvey

Published by Williams & Wilkins
AUTHOR INDEX

Anderson, D. J., 289
Appleton, M. L., 21
Arnaudeau, S., 130
Arneric, S. P., 289
Asin, K. E., 150
Bader, J. P., 298
Bagdon, W., 271
Balena, R., 277
Bartoszyk, G. D., 41
Berti, F., 355
Bianchi, B., 150
Birkett, D. J., 101
Boado, R. J., 206
Born, S. L., 258
Bouchard, P., 223
Britton, D. R., 150
Brodie, M. S., 34
Brouwer, W. G., 298
Bryant, C. M., 5
Buccellati, C., 335
Buckheit, R. W., Jr., 298
Burnett, V. L., 258
Burnstock, G., 93
Cantor, C. R., 326
Cao, L. S., 109
Chen, J., 1
Chen, L. Y., 253
Chen, Z., 194
Chin, M. H., 74
Christie, M. D. J., 137
Chuang, D.-M., 143
Cioffi, C. L., 74
Conte, B., 212
Currens, M. J., 298
Cutrufo, C., 212
Davis, L. S., 316
de Fonseca, F. R., 56
DelGrande, D., 74
Diagne, A., 246
DiDomenico, S., 150
Donevan, S. D., 161
Donnelly-Roberts, D., 289
Duman, R. S., 306
Dunn, C., 265
Edwards, J. W., 101
Edwards, R. M., 125
Endemann, G., 5
Farley, J. M., 178
Felauer, E. E., 298
Feng, Y., 5
Fogarasi, M., 326
Folco, G. C., 335
Freel, R. W., 187
Furukawa, S., 231
Furukawa, Y., 231
Gao, X.-M., 143
Garay, M., 74
Gentile, M., 277
Gonzalez, F. J., 21
Gopalakrishnan, M., 289
Graham, S. H., 1
Gulakowski, R. J., 298
Guy, J., 271
Haldert, J. R., 258
Hamada, Y., 49
Hamilton, G. S., 5
Hanaoka, Y., 231
Hara, T., 49
Harbon, S., 130
Harting, J., 41
Hashimoto, K., 316
Hatanaka, K.-I., 84
Hatch, M., 187
Hawranko, A. A., 65
Hayashi, K., 231
Hayes, W. C., 271
Hnatowich, D. J., 326
Hodges, L., 150
Hollingsworth, Z. R., 342
Hong, Y., 150
Hotta, N., 49
Hough, J. J., 143
Hussain, T., 284
Irwin, R. P., 143
Jackson, E. K., 13
Jennifer, P., 150
Johns, R. A., 30
Jones, G. S., Jr., 169
Junien, J.-L., 223
Kang, Y.-S., 246
Kawasaki-Yatsugi, S., 84
Khac, L. D., 130
King, B. F., 93
Kline, W. F., 271
Koh, N., 49
Koob, G. F., 56
Koshiya, K., 84
Kraner, J. C., 258
Lan, J. Q., 1
Lane, S. B., 306
Lash, L. H., 194
Lepretre, N., 130
Liu, W. C., 150
Liu, Q., 116
Lindel, J., 284
Lipsky, P. E., 316
Lipson, K. E., 74
Liu, D. Y., 5
Liu, X., 178
Loring, R. H., 169
Maclouf, J., 335
Mahan, L., 150
Manzini, S., 212
Mariadoss, G., 326
Markatos, A., 277
Matsakoufa, S., 231
Maziot, J. X., 109
McHugh, T., 169
McKay, J., 169
McMahon, J. B., 298
Mehta, J. L., 253
Menzaghi, F., 56
Merlo-Fich, E., 56
Mewshaw, R. E., 5
Michaeldides, M., 150
Mikusa, J., 150
Miller, T., 150
Minck, K.-O., 41
Miners, J. O., 101
Mironneau, J., 130
Miserevendo, M. J. D., 306
Molinari, E. J., 289
Molta, C., 335
Monroe, P. J., 65
Montegi, L. M., 289
Morgan, E. T., 258
Mori, K., 49
Mugrage, B., 74
Muller-Peddinghaus, R., 335
Murase, K., 84
Mustafa, S. J., 284
Nakamura, J., 49
Nakashima, E., 49
Narayanan, V. L., 298
Naruse, K., 49
Navarro, M., 56
Neale, R. F., 74
Nestler, E. J., 306
Nikkel, A., 150
Ohi, T., 231
Ohmori, J., 84
Okada, M., 84
Omiecienski, C. J., 238
Osborne, P. B., 137
Partridge, W. M., 206, 246
Pedrosi, B. M., 194
Peerboom-Stegeman, J. H. J. C., 219
Peng, Y. B., 116
Perumattam, J., 5
Peter, C. P., 271, 277
Piattoni-Kaplan, M., 289
Pintor, J., 93
Poel, T. S., 258
Quirion, R., 223
Rengasamy, A., 30
Riviera, J., 56
Rodan, G. A., 277
Rogowski, M. A., 143, 161
Roman, F., 225
Rossoni, G., 335
Rubin, C. S., 306
Rubio, P., 56
Rudolf, G. D., 342
Rusckoowski, M., 326
Ruscel, F. G. M., 219
Russell, D. S., 306
Russell, J. D., 298
Saita, K., 231
Sakakibara, F., 49
Sakamoto, N., 49
Sakamoto, S., 84
Sala, A., 335
Samii, K., 109
Sano, T., 326
Schultz, R. J., 298
Seedor, J. G., 277
Self, D. W., 306
Shahinfar, S., 187
Shea, M., 271
Shetty, S. S., 74
Shimizu-Sasamata, M., 84
Shiosaki, K., 150
Shoemaker, R. H., 298
Sidhu, J. S., 238
Sills, M. A., 74
Simon, R. P., 1
Smith, C. L., 326
Smith, D. J., 65
Smith, D. L., 65
Smith, L., 150
Stack, E. J., 125
Standaert, D. G., 342
Stark, C., 277
Stashko, M., 150
Stinson, S. F., 298
Subramaniam, S., 161
Sullivan, J. P., 289
Sun, F. F., 265
Tao, X., 316
Tassaneeyakul, W., 101, 101
Testa, C. M., 342
Testa, T., 335
Thornton-Manning, J., 21
Tofovic, S. P., 13
Togami, J., 84
Tokarz, J. L., 194
Trifunović, R. D., 34
Trizna, W., 125
Tukey, R. H., 101
Usuda, S., 84
Vaidya, V. A., 306
van der Aa, E. M., 219
Vaziri, N. D., 187
Veronese, M. E., 101
Verrijt, C. E. H., 219
Vistica, D. T., 298
Wakao, T., 49
Wang, S., 93
Weinstock, J., 125
Widnell, K. L., 306
Wills, W. D., 116
Winnard, P., Jr., 326
Wong, P. Y.-K., 265
Woods, E. B., 194
Wouterse, A. C., 219
Wu, D., 206
Xie, Y., 169
Yatsugi, S.-I., 84
Yin, K., 265
Yost, G. S., 21
Yue, G., 265
Zack, J. A., 246
Ziganshina, A. U., 93
Ziganshina, L. E., 93
National Institutes of Health

Director
National Institute of General Medicine Sciences

The National Institutes of Health (NIH) invites applications for the position of Director, National Institute of General Medical Sciences (NIGMS). NIGMS is one of the 25 institutes, centers, and divisions that comprise the NIH, and is the Institute that provides funding support for the most basic of the biomedical research programs. The mission is to promote the development of new scientific knowledge regarding the fundamental structures and life processes that underlie human health. The Director provides leadership, direction and coordination of the Institute's programs; formulates overall policies relating to the Institute's programs and goals; provides management and administrative services to the Institute; collects data and disseminates information on basic biomedical research undertakings; and insures that results of Institute research are appropriately evaluated and transferred to the medical community and the public. The NIGMS employs 171 Full Time Equivalent (FTE) staff members who administer an annual budget of $904 million.

This is a Civil Service position in the Senior Executive Services (SES), with a salary ranging from ES-1 to ES-6 level (currently $97,991 to $122,040 including a locality allowance). Physicians may be eligible for a comparability allowance of up to $20,000 per annum. A recruitment bonus of up to 25% of base pay may be available to a non-Federal candidate selected for this position, subject to individual approval. A relocation bonus of up to 25% of base pay may be available to a permanent Federal employee who must relocate to accept this position, subject to individual approval. A one-year probationary period must be served by the individual selected if not currently in the career SES.

The vacancy announcement with mandatory and desirable qualifications requirements can be obtained by calling (301) 496-1443. Applicants are required to submit a Bibliography, and either a Curriculum Vitae, Application for Federal Employment (SF-171), Optional Application for Federal Employment (OF-612), Resume, or any other written format which addresses the requirements indicated in this announcement, to the following address:

National Institutes of Health
Division of Senior Systems
6120 Executive Blvd., Suite 100
Rockville, Maryland 20852
Attention: Fred Walker

Applications must be postmarked no later than March 29, 1996

Applicants with access to E-Mail may transmit their materials to the following E-Mail address:
fewalker@helix.nih.gov

Applicants with access to the Internet's World Wide Web may wish to browse the NIH Home Page, and may apply through the Web at the following URL:

Application materials may be FAXed to (301) 402-6139
(please limit FAXed materials to no more than 10 pages)

Selection for this position will be based solely on merit, with no discrimination for non-merit reasons such as race, color, religion, sex, national origin, political affiliation, marital status, sexual orientation, handicapping condition, age or membership or non-membership in an employee organization.

NIH is an Equal Opportunity Employer

Need Shelf Space?

Free 98% of your shelf space with microform conversion.

Williams & Wilkins is your source for back issues of this journal in microform.

Microfilm editions are available for this journal direct from the publisher. Many Williams & Wilkins journals are also available for a single volume year or on a standing order basis.

For ordering information: Write to the address below or call TOLL FREE 1-800-638-6423.

Formats available:
16-mm reel open reel (positive or negative)
16 3M cartridge (positive or negative)
16-mm Ektamate/ANSI (positive or negative)
35-mm open reel (positive or negative)
microfiche (positive or negative)

Mail to:

In Europe, write to:
Williams & Wilkins
Microfilm Sales
351 West Camden Street
Baltimore, MD 21201-2436

London SW6 1AA England

Please Send Rate Sheet.

Name
Title
Address
City/State/Zip

MICA 56249
Notice to Contributors (Revised July 1, 1994)

Scope of Submitted Manuscripts
The Journal invites for review original papers dealing with interactions of chemicals with biological systems. Any aspect of pharmacology and therapeutics is included, but descriptive case reports without dose response or mechanism studies are not accepted. Manuscripts dealing primarily with new methods will be reviewed only if data are presented showing new or more reliable pharmacological information has been obtained by use of the methods.

Submission of Manuscripts
Submit four copies of manuscript to Dr. John A. Harvey, Editor in Chief, Journal of Pharmacology and Experimental Therapeutics, Medical College of Pennsylvania and Hospital, 3300 Henry Avenue, Philadelphia, PA 19129, accompanied by a check or purchase order for $40.00 manuscript handling fee (in U.S. funds drawn on a U.S. bank payable to ASPET). If submission of the manuscript handling fee entails financial hardship to the author, the fee will be waived. In that event the authors should submit a request for waiver of the fee at the time the manuscript is submitted. Only one copy of rejected manuscripts will be returned. Extra copies of figures will not be returned unless specifically requested at the time the manuscript is submitted.

Manuscripts should be typewritten and double spaced in the English language using one side only of approximately 21.6 by 28 cm paper. One original drawing or photograph of each line figure and four (4) clear copies and/or 4 original drawings or photographs of each halftone figure are required. Pages should not be stapled together.

Authors submitting a manuscript do so with the understanding that if it is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the Society for Pharmacology and Experimental Therapeutics. Reasonable requests by authors for permission to reproduce their contributions to the Journal will not be refused. It will be necessary for all authors to sign an assignment of copyright form which will be mailed from the Editorial Office on acceptance of the manuscript. The only exceptions will be manuscripts on work performed by employees of the U.S. Federal Government.

Cover Letter
Each manuscript must be accompanied by a written statement signed by one author: “The undersigned author affirms that the manuscript (title of article) and the data it contains are original, are not under consideration by another journal, and have not been published previously. The studies reported in this manuscript have been carried out in accordance with the Declaration of Helsinki and/or with the Guide for the Care and Use of Laboratory Animals as adopted and promulgated by the National Institute of Health”. Authors should also indicate in the cover letter the field of pharmacology to which the research applies.

Organization of the Manuscript
In most cases manuscripts should contain the following sections in the order listed; each section should begin on a new page and all pages should be numbered consecutively.

1. Title page: This should contain the complete title of the manuscript, the names of all authors, and the laboratory of origin. Support for the research should be indicated as a numbered footnote to the title and included with other footnotes on a separate page following the reference section.

2. Running title page: a) A running title should be composed of at least 36 spaces, including punctuation. It should convey the sense of the title. Commonly used abbreviations (such as "ATP", "ACh," etc.) may be used in the running title. b) Corresponding author: this page should also contain the name, address, telephone and fax number of the person to whom all correspondence should be sent. c) A list of abbreviations used in the paper should also appear on this page. Additionally, each abbreviation should be defined immediately it is used in the text.

3. Abstract: The abstract should present in a concise form the purpose, the general methods, the findings, and the conclusions of the manuscript. Abstracts should be limited to 200 words; abstracts of more than 250 words will not be accepted.

4. Introduction: This section should not be labeled, but should begin on a new page. It should contain a clear statement of aims of the reported work or of the hypothesis which the work was designed to test. A brief account of the background of the reported work may also be given in this section.

5. Methods: This section should contain explicit, concise descriptions of all new methods or procedures employed. Modifications of previously published methods should be described. Commonly used methods require only a citation of the original source. When methods are described, the description should be such as to enable the reader to judge their accuracy, reproducibility and reliability and to repeat the experiment. Very extended descriptions of methods may be submitted for deposit with the American Society for Information Science National Auxiliary Publications Service (NAPS) or Microfiche Publications, P.O. Box 3513, Grand Central Station, New York, NY 10017. A text reference or footnote stating that the full description is available from NAPS permits interested readers to obtain the information and does not occupy an inordinate amount of Journal space. There is a nominal charge to authors for this procedure; those who request the complete information from NAPS pay a small fee.

6. Results: This section ordinarily contains the experimental data to be presented, but not extended discussions of their significance. Results should usually be presented in graphic or tabular form, rather than discursively. Graphic presentation of data is often preferred but there should not be duplication in text, tables and figures. Sufficient data must be given to allow readers to judge the variability and reliability of the results. Statistical tests used and the data analyzed should be explained so that the findings can be interpreted and evaluated.

7. Discussion: This section should present conclusions to be drawn from the results. Special emphasis should not be placed on information which has been discovered, but the speculation should be based on the data presented and identified as such. The discussion should be as concise as possible, within the limits of the ideas which the authors wish to propose and adequate discussion of related work by others.

8. Acknowledgments: This section should begin on a separate page, have a separate heading, and be placed at the end of the text of the manuscript. Gifts and assistance can be acknowledged here but, financial support should appear in a footnote to the title.

9. References: In text citations give the author's name and the year of publication (e.g., McCarthy, 1952; Ruth and Gehrig, 1929). With more than two authors, the text citation should contain the name of the first author, followed by "et al.," and, in the list of references, entries should be arranged alphabetically by author and not numbered. All authors' names should be given. If reference is made to more than one publication by the same authors in the same year, suffixes (a, b, c, etc.) should be added to the year in the text citation and in the list of references.

The list of references should contain, in sequence, the following information: authors' names and initials, title of the cited article, title of the journal in which it appeared, volume number of the journal, inclusive pagination and year of publication. Abbreviations for journals should conform to the Biois List of Serials (BioSciences Information Services of Biological Abstracts, Philadelphia, PA 19103). Citations of personal communications, unpublished observations, and papers submitted for publication should be given in parentheses at the appropriate place in the text, not in the list of references. A paper may not be cited as "in press" unless it is accepted for publication. In such cases the name of the journal must be given.

Examples of references to books, chapters and journal articles follow:


Tallarida, R. J. and Murray, R. B.: Manual of Pharmacologic

No more than four references should be cited in support of any given point. The authors are responsible for accuracy of such citations and are urged to take the utmost care in proofreading citations and the reference list.

10. Footnotes. All footnotes to the title, authors’ names or text should be indicated by arabic numeral superscripts, not by letters or other symbols. The footnotes should be typed in sequence on a separate page, not a text page. Footnotes to tables are discussed under Tables, below.

11. Tables. Each table should be on a separate page. Tables should be numbered consecutively with arabic numerals, and should be designed to fit the column or page size of the Journal. A brief descriptive title should be given at the top of each table. The table number should be given in capital letters, the title in boldface upper and lower case letters (e.g., TABLE 3).

Uptake of labeled drug by rat liver slices. The footnotes to the tables should be referenced by italicized lower case superscript letters (a, b, c, etc.) and should appear beneath the table involved, not on a separate page of the manuscript. Extensive tabular material not absolutely essential to the manuscript will be accepted for deposit with the ASIS/NAPS (see “Methods,” above). In such instances a footnote in the published paper will refer the interested readers to NAPS from which copies may be obtained. Note Statistics below for expressions of probability.

12. Legends for figures. These should be numbered consecutively in arabic numerals and should appear on a separate page of the manuscript. Legends should explain the figures in sufficient detail so that frequent referral to the text is unnecessary, but efforts should be made to avoid unnecessary length. Abbreviations in the legends should conform to those in the text (see “Abbreviations,” below).

13. Figures. Illustrations should be submitted as unmounted glossy prints, or laser jet quality figures, preferably reduced to single column size (approximately 3½ inches in width) to permit reproduction without further reduction. Otherwise, prints should be larger than 8 by 10 inches and clear enough to permit reproduction without retouching after reduction. The author’s name and address and the number of the figure should be placed on the back of each print. A typed label is usually most satisfactory. Ball type pen should not be used. Note Statistics below for expressions of probability. Uniform symbols 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.

14. Index Terms. A list of index terms useful in constructing the annual index should be included as the last page of the manuscript.

Statistics
Whenever possible statistical probability (P) in tables, figures, and figure legends should be expressed as * P < .05, ** P < .01 and *** P < .001. For second comparisons the symbols † may be used similarly. Authors are urged to avoid unnecessary complexity and to be consistent within the manuscript. In the event of multiple comparisons within a table, footnotes, a, b, c, etc. should be used.

Abbreviations
Magnitudes of variables reported should be expressed in numerals. Most abbreviations are used without punctuation, with no distinction between singular and plural forms (e.g., 1 mg, 25 mg; 1 sec, 25 sec). The usual prefixes are to be used for multiples or submultiples of the basic units (e.g., kg, g, mg, µg, ng, pg). The following abbreviations, or their properly prefixed multiples or submultiples, may be used without definition in the text, tables and figures:

<table>
<thead>
<tr>
<th>Units of mass</th>
<th>Units of electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>gram (g)</td>
<td>volt (V)</td>
</tr>
<tr>
<td>mole (mol)</td>
<td>ampere (A)</td>
</tr>
<tr>
<td>equivalent (E)</td>
<td>cycle/sec (Hz)</td>
</tr>
<tr>
<td>microatom (µat)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units of concentration</th>
<th>Units of radioactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>molar (moles/liter)</td>
<td>curie (Ci)</td>
</tr>
<tr>
<td>normal (Eq/liter)</td>
<td>counts per min (cpm)</td>
</tr>
<tr>
<td>percent</td>
<td>disintegrations (dpm)</td>
</tr>
<tr>
<td></td>
<td>per min</td>
</tr>
<tr>
<td></td>
<td>roentgen (r)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units of length or volume</th>
<th>Units of time</th>
</tr>
</thead>
<tbody>
<tr>
<td>meter (m)</td>
<td>hour (hr or h)</td>
</tr>
<tr>
<td>micron (µ)</td>
<td>minute (min or m)</td>
</tr>
<tr>
<td>liter (l)</td>
<td>second (sec or s)</td>
</tr>
</tbody>
</table>

Kinetics
<table>
<thead>
<tr>
<th>dissociation constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kd</td>
</tr>
</tbody>
</table>

Dissociation constant of
enzyme substrate complex $K_c$
enzyme inhibitor complex $K_i$
Michaelis constant $K_m$
maximum initial velocity $V_{max}$

Miscellaneous
<table>
<thead>
<tr>
<th>degrees of temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
</tr>
<tr>
<td>gravity</td>
</tr>
<tr>
<td>g</td>
</tr>
<tr>
<td>median doses</td>
</tr>
<tr>
<td>LD₅₀, ED₅₀, etc.</td>
</tr>
<tr>
<td>optically isometric forms</td>
</tr>
<tr>
<td>d₁, l₁, d₂, l₂</td>
</tr>
<tr>
<td>routes of drug administration</td>
</tr>
<tr>
<td>i.v., i.p., s.c., i.m.</td>
</tr>
<tr>
<td>standard deviation</td>
</tr>
<tr>
<td>S.D.</td>
</tr>
<tr>
<td>error</td>
</tr>
<tr>
<td>S.E.</td>
</tr>
</tbody>
</table>

Whenever an abbreviation other than those above is to be used in a manuscript, it is to be defined in the text or in a footnote thereto, the first time it is used. Abbreviations for commonly used substances should be those recommended by the Journal of Biological Chemistry. Abbreviations for drugs may be used if properly defined on first use and if the chemical or generic name of the drug is given when the abbreviation is first used. Abbreviations may be used in the running title but not in the full title of the manuscript.

Drugs
Generic names should be used in text, tables and figures. Trade names may be mentioned in parentheses in the first text reference to the drug but should not appear in titles, figures or tables. When a trade name is used, it should be capitalized; generic or chemical names are not capitalized. The chemical nature of new drugs must be given when it is known. The form of drug used in calculations of doses (e.g., base or salt) should be indicated. When several drugs are used, it may save space to include a separate paragraph in “Methods,” or a separate table or footnote, listing the relevant information about all drugs employed.

Page Charges
Authors are assessed page charges at the rate of $30 per printed page. With the page proof, authors will receive a request for information concerning such charges. These charges will be assessed only if they involve no personal expense to the authors. Request for waiver should be addressed to the ASPET Executive Officer at the time billing is received.

The cost of a limited number of illustrations will be borne by the Journal; the cost of excessive illustrations and of colored illustrations will have to be defrayed by the authors.

After acceptance: When the field editor recommends acceptance of an article for publication, authors are encouraged to submit electronic diskettes of the final version along with the typed REVISED manuscript. The author will receive a packet of information containing copyright forms and detailed instructions pertaining to the publication of their manuscript.

Reprints and page charges. An order form for reprints as well as information on the estimation of page charges will be mailed with the galleys proof. Please direct questions on page charges, or other business matters to Ray Croker, Executive Officer, American Society for Pharmacology and Experimental Therapeutics, 9850 Rockville Pike, Bethesda, MD 20814.
STATEMENT OF OWNERSHIP MANAGEMENT AND CIRCULATION (Required by 39 U.S.C. 3685)

1. Title of publication: THE JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS;
2. Publication no.: 0022-3565. 3. Date of filing: 10-01-95. 4. Frequency of issue: Monthly
5. No. of issues published annually: 12; 6. Annual subscription price: $190.00. 7. Complete mailing address of known office of publication: 351 West Camden Street, Baltimore, MD 21201-2436.
8. Complete mailing address of the headquarters of general business offices of the publisher: 351 West Camden Street, Baltimore, MD 21201-2436.
9. Full names and complete mailing address of publisher, editor, and managing editor: Publisher: Williams & Wilkins, 351 West Camden Street, Baltimore, MD 21201-2436; Editor: John A. Harvey, Ph.D., Chief, Division of Behavioral Neurobiology, Department of Pharmacology, The Medical College of PA at EPPI, 3200 Henry Avenue, Philadelphia, PA 19129. Managing Editor: N/A.
10. Owner: American Society of Pharmacology and Experimental Therapeutics, c/o Kay Croker, Executive Director, 9650 Rockville Pike, Bethesda, MD 20814.
11. Known bondholders, mortgagees, and other security holders owning or holding 1% or more of total amount of bonds, mortgages, or other securities: None.
12. Purpose, function, and nonprofit status: Has not changed during preceding 12 months.
13. Publication Name: THE JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS
15. Extent and nature of circulation: Average number of copies each issue during preceding 12 months: (a) Total No. copies (Net Press Run), 3357. (b) Paid and/or requested circulation; (1) Sales through dealers and carriers, street vendors and counter sales (not mailed), 362; (2) Paid or Requested mail subscriptions (include Advertisers Proof Copies/Exchange Copies), 2138. (c) Total paid and/or requested circulation (sum of 15b(1) and 15b(2)), 2500. (d) Free distribution by mail (samples, complimentary, and other free copies), 176. (e) Free distribution outside the mail (carriers or other means), none. (f) Total free distribution (sum of 15d and 15e), 176. (g) Total distribution (Sum of 15c and 15f) 2676. (h) Copies not distributed: (1) Office use, leftovers, spoiled, 681; (2) Return from news agents, none. (i) Total (sum of 15g, 15h(1), and 15h(2)), 3357. Percent Paid and/or Requested Circulation (15c/15g x 100) 93.42%. Actual no. copies of single issue published nearest to filing date: (a) Total no. copies (Net Press Run), 3226. (b) Paid and/or requested circulation; (1) Sales through dealers and carriers, street vendors and counter sales (not mailed), 290; (2) Paid or Requested mail subscriptions (include Advertisers Proof Copies/Exchange Copies), 2291. (c) Total paid and/or requested circulation (sum of 15b(1) and 15b(2)), 2581. (d) Free distribution by mail (samples, complimentary, and other free copies), 11. (e) Free distribution outside the mail (carriers or other means), none. (f) Total free distribution (sum of 15d and 15e), 11. (g) Total distribution (Sum of 15c and 15f), 2592. (h) Copies not distributed: (1) Office use, leftovers, spoiled, 634; (2) Return from news agents, none. (i) Total (sum of 15g, 15h(1), and 15h(2)), 3226. Percent Paid and/or Requested Circulation (15c/15g x 100), 99.57%.
16. This Statement of Ownership will be printed in the December issue of this publication.
17. I certify that the statements made by me above are correct and complete.

Alma J. Wills
Publisher