BRITISH JOURNAL OF PHARMACOLOGY

INSTRUCTIONS TO AUTHORS

The *British Journal of Pharmacology* welcomes contributions in all fields of pharmacology for publication as full papers or as short communications. Abstracts of oral and poster communications and demonstrations to the British Pharmacological Society are published separately in the Proceedings Supplements of the *British Journal of Pharmacology*.

Papers should normally be based on new results obtained experimentally and should constitute a significant contribution to pharmacological knowledge. Papers which reassess pharmacological concepts based on earlier results will also be considered. Papers dealing only with descriptions of methods are acceptable if new principles are involved.

Contributions that have already been published, or accepted for publication, with essentially the same content will not be considered. This restriction does not exclude results published as abstracts of communications, letters to editors, or as contributions to symposia, provided that the submission adds significantly to the information available in the previously published contribution.

Papers are accepted only if accompanied by the following statement 'This manuscript has not been nor will be published in whole or in part by any other journal'. This statement must be signed by all authors. Authors are also required to assign the copyright of all papers accepted for publication to the British Pharmacological Society.

The Journal will reject papers which describe experiments on animals which do not fall clearly within the current laws governing animal experimentation in the United Kingdom. Authors must make it clear that the procedures they used were as humane as possible and the use of anaesthetics and analgesics must be well defined. The Society has an Ethics Committee which can be consulted by authors through the secretary of the Editorial Board.

When clinical trials or investigations on human subjects are reported, evidence of approval by a local Ethical Committee must be given.

Papers should be as brief as possible. Authors should remember that a reader may be influenced by literary style and will probably appreciate simple but accurate prose. It is often helpful if authors ask someone not directly connected with their work to criticize their manuscript before submission.

Failure to comply with 'Instructions to Authors' leads to considerable editorial delays.

Full papers

Manuscripts should be typed in duplicate in double spacing with margins of 1 in/2.5 cm on one side of A4 (210 × 297 mm) paper. Papers in recent issues of the *British Journal of Pharmacology* should be consulted for the general lay-out of the paper and also for details. The following subdivisions are used:

1. Title page
2. Summary
3. Introduction
4. Methods
5. Results
6. Discussion and conclusions
7. Acknowledgements
8. List of references
9. Tables
10. Figures and captions

Title page

The title should normally contain no more than 150 characters. There should be a separate title page giving the names of authors (in alphabetical order) and their appropriate addresses. It should be made clear which address relates to which author. Authors' present addresses differing from those at which the work was carried out should be given as a footnote on the title page and referenced at the appropriate place in the author list by superscript numbers. A footnote may also be used to indicate the author to whom correspondence should be sent. The use of footnotes for any other reason is not allowed. If the address to which proofs should be sent is not that of the first mentioned author, clear instructions should be given in a covering note and not on the title page. The title page should be paginated as page 1 of the paper.

A short running title containing not more than 50 characters and spaces should also be suggested. Key words are necessary for the computerised indexing of the paper. Up to ten key words or phrases of two to three words should be displayed on the title page. These may be selected from 'Medical Subject Headings' issued by *Index Medicus* and should avoid unhelpful or unqualified terms such as 'rat', 'drug' etc.

Summary

The summary will be printed at the beginning of the paper. It should not exceed 5% of the length of the

paper and should contain a precise account of the problem, the methods, results and the conclusions. It should be arranged in numbered paragraphs which should be concise and not unnecessarily numerous.

Introduction

The introduction should give a concise and clear account of the background of the problem and the rationale of the investigation. Only previous work that has a direct bearing on the present problem should be quoted.

Methods

The methods must be described in sufficient detail to allow the experiment to be interpreted and repeated by the reader, e.g. the method of anaesthesia must be described, the composition of solvents, solutions, electrical stimulation parameters etc. should be given. However, detailed repetition of methods which have been adequately described previously should be avoided and references given, although a brief outline is often helpful. Composition of salt solutions is best given in mM; if actual weights are preferred, it is important to state whether anhydrous or crystallized salts were used.

Drugs should be listed in a separate paragraph. Their names should be 'approved names' as published previously by the British Pharmacopoeia Commission (1970) and now by the Medicines Commission and in the supplementary lists. If a drug has no 'approved name' its chemical name must be used and the rules set out in the *Handbook for Chemical Society Authors* (London, Chemical Society, 1961) observed, or its structural formula given. Cumbersome chemical names should be suitably abbreviated for later reference in the paper.

The doses of drugs should be given as unit weight per body weight, e.g. mmol kg^{-1} or mg kg^{-1}; concentrations should be given in terms of molarity, e.g. nM or μM.

Reference should be made to any statistical analyses that have been performed on the results in order, for example, to determine the significance of differences between results obtained under different experimental conditions. Evidence should be presented for the accuracy, reproducibility and sensitivity of the assay systems used unless this is available in previous publications. For example, in the case of radioimmunoassays the source of the antibody, validation of specificity, limits of detection, non-specific binding of labelled ligand, sample recovery and precision (both the intra-assay and inter-assay coefficients of variation) should be indicated and for differential assays, the discrimination.

Results

The description of the experimental results should be succinct but, nevertheless, in sufficient detail to allow the experiments to be repeated by others. Typical single experiments may be presented with a clear statement that n number of similar experiments had similar results. Where appropriate, however, the mean results with confidence limits or with standard errors of the means and the number of observations should be given. Unwarranted numbers of digits should be avoided. Statistical tests of significance should be performed where appropriate. The results of such tests should be stated as the numerical value of the probability (P) that is calculated, with any necessary clarification (e.g. one-tail or two-tail test). It is permissable to use some abbreviation for ranges of P values; for example, * represents $0.05 > P > 0.01$ and ** represents $0.01 > P > 0.005$.

Data should not be unnecessarily repeated in the text, tables and figures. Conclusions and theoretical considerations should not be elaborated in this section unless the reason for performing a particular experiment is otherwise obscure.

Discussion

The purpose of the discussion is to present a pertinent interpretation of the results against the background of existing knowledge. Any assumptions on which conclusions are based must be stated clearly. A mere recapitulation of the results is not acceptable. A review-like treatment, which reduces the impact on the reader, should also be avoided.

Acknowledgements

Acknowledgements should be brief but should include reference to sources of support. Sources of drugs not freely available commercially should be acknowledged.

References

In the text, references to other work should take the form: (Bolton & Kitamura, 1983) or, 'Bolton & Kitamura (1983) showed that ....' If there are more than two authors, the first author's name should be given followed by '*et al.*'.

References to 'unpublished observations' or 'personal communications' should be mentioned in the text only, e.g. (XYZ, personal communication) and not included in the list of references. Papers which have been submitted *and accepted* for publication, should be included in the list of references with the names of the periodical and 'in press'. Papers in preparation must not be included in the list of references.

The reference list at the end of the manuscript must be arranged alphabetically according to the surname of the first author. The AUTHORS' names are followed

by the year of publication in brackets. If more than one paper by the same authors in one year are cited, a, b, c, etc. are placed after the year of publication, both in the text and in the list of references. The title of the article is given in full, followed by the *abbreviated title of the periodical*, volume **number** and first and last page numbers. The abbreviations used for periodicals are those of the most recent edition of the *World List of Scientific Periodicals*. A selected list of abbreviations has been issued by the Biological Council. References to articles in books should consist of names of AUTHORS, year of publication, title of article followed by the *title of the book*, the editors, volume number, if any, and page numbers, the place of publication and the names of the publishers. For example:

BOLTON, T.B. & KITAMURA, K. (1983). Evidence that ionic channels associated with the muscarinic receptor of smooth muscle may admit calcium. *Br. J. Pharmac.*, **78**, 405–416.

BRADING, A.F. (1981). Ionic distribution and mechanisms of transmembrane ion movements in smooth muscle. In *Smooth Muscle: An Assessment of Current Knowledge*. ed. Bülbring, E., Brading, A.F., Jones, A.W. & Tomita, T. pp. 65–92. London: Edward Arnold.

Tables

Each table should be given on a separate page, paginated as part of the paper. Tables should be numbered consecutively with arabic numerals and the number should be followed by a brief descriptive caption, occupying not more than two lines, at the head of the table. The proportions of the text area should be borne in mind when designing the layout of tables. For the sake of clarity, tables should not have more than 85 characters to a line, with spaces between columns counted as four characters. The absolute maximum is 110 characters to a line. Column headings should be marked for setting in italics (underlined in the typescript). Except in special circumstances, tables should be self-explanatory; the necessary descriptions should be at the bottom of the table. References to individual items should be made by using the following symbols: * † ‡ § ¶.

Figures

Unnecessary figures should be avoided, particularly those requiring half-tone reproduction. They should not be larger than size A4 (210 × 297 mm). Author's names should be given on the back of the figures; the number and the top of the figure (if critical and not obvious) should also be indicated. Original drawings in black ink on white stout paper or faint blue graph paper are preferred and should be carefully prepared to conform with the style and conventions of the journal as they will not normally be redrawn. Two sets of figures (or one set and one photocopy) should be submitted with each manuscript. All lettering should be clearly indicated, in pencil.

Good photographic copies of original drawings are also acceptable. Original drawings or their photographic reproductions must be larger than, but not more than twice as large as their final size in the journal. It is of the greatest importance that the final size of the symbols after reduction is not smaller than 2 mm in diameter and the lines not less than 0.2 mm broad; the respective values in the original drawings should therefore be about 4 mm and 0.4 mm. Symbols should be chosen from the following set and, as far as possible, should be used in the sequence presented here.

○ ● □ ■ △ ▲ ▽ ▼ ◇ ◆ + ×

Tracings may be in the form of originals or high quality photographic prints on matt paper. If the tracings are made on lined paper then, wherever possible, the grid should be painted out in white. Photographs and micro-photographs should be printed on glossy paper. The size should be larger than, but not more than twice as large as the final size in the journal. Lettering should be shown on one set only. The originals of ECG's and other records which have a lined background are preferred to photographic copies. Negative prints of kymograph and oscilloscope tracings should be used so that the tracings appear black on white and large black areas are avoided. In all tracings or graphs, both abscissae and ordinates should be calibrated. The proportions of the printed page should be borne in mind when preparing all figures.

The author should state what conclusions may be drawn from the figure. Each figure should be accompanied by a caption typed on a separate sheet of paper and paginated as part of the paper. Captions should explain the figures in sufficient detail that, in most circumstances, they can be understood without reference to the text.

Unsatisfactory figures may be returned to the author for revision, or may be the reason for rejection of the paper.

Proofs. Two sets of page proofs, will be supplied, one of which may be retained by the authors. The other should be corrected immediately and returned to the Press Editor. Corrections should be kept to a minimum.

Short communications

The main purpose of short communications is the rapid publication of new results of sufficient importance *to merit priority of publication over full papers.* Revision is not normally allowed; they are accepted

as they stand or they are rejected. If there is material worth publishing, but significant revision is required, or if the manuscript is not considered to merit priority of publication, the Board may propose publication as a full paper. Typescripts must be submitted in duplicate in double spacing on one side of size A4 paper and conform in every respect to the format and conventions of the journal as outlined under 'Full papers'. Particular attention must be paid to correctness of abbreviations, grammar and spelling. The length, including title, summary and references, must not exceed 1200 words plus one figure or one table. There should be a short summary consisting of a single paragraph, followed by introduction, methods, results, discussion and select references.

Abbreviations and symbols

Further details of abbreviations, symbols and terminology may be found in the following publications:

Amino acids	ref 17
Anatomical	ref 2
Biochemical	refs 1, 5
Centrifugal	ref 1
Chemical	refs 1, 7, 14
Enzyme	refs 1, 8, 13
Haematological	ref 6
Isotopic	ref 1
Micro-organisms	refs 3, 4
Physical (incl. SI units)	refs 9, 10
Physiological	ref 11, 18
Psychological	ref 12
Peptides	ref 16
Steroids	ref 15

Physico-chemical quantities

The British Journal of Pharmacology uses the SI symbols for units (see refs 9 and 10).

Prefixes for SI units. The following prefixes for multiples of units should be used:

Multiplier	*Prefix*	*Symbol*
10^{-1}	deci	d
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

Multiplier	*Prefix*	*Symbol*
10^{3}	kilo	k
10^{6}	mega	M
19^{9}	giga	G
10^{12}	tera	T

Thus, micron = μm; ångstrom = 0.1 nm. Mixed prefixes are not permissible, thus mμg should be ng. The symbols d (10^{-1}) and c (10^{-2}) should be restricted to those occasions on which there is a strongly felt need for them (e.g. cm).

Use of the solidus

The solidus should be avoided as far as possible and the negative index substituted, e.g. mg kg^{-1} rather than mg/kg; pmol mm^{-2} min^{-1} rather than pmol/mm^2/min

Symbols

Symbols denoting physical quantities are usually printed as italic capitals (indicated by single underline in typescript). A dash over the symbol indicates a mean value; a dot over the symbol indicates a time derivative. Suffixes may be used to indicate 'where' and 'what'. They are printed as inferiors on the line. Multiple suffixes should be avoided if a simpler symbol adequately defined is unambiguous, but if necessary should be separated by commas e.g. P_{A,CO_2} denotes partial pressure of CO_2 alveolar air.

Quantity	*Abbreviation*	*Preferred unit*	*Symbol*
Amount (of substance)	M†	mole	mol
Capacitance	C	farad	F
Concentration	C†	moles per litre	M or mol l^{-1}
Current	I	ampere	A
Electrical conductance	G	siemens	S
Electromotive force	*e.m.f.*	volt	V
Flow (blood or other liquid)	$\dot{Q}$†	litres per second (or min)	$l\,s^{-1}$ or $l\,min^{-1}$
Flow (air or other gas)	$\dot{V}$†	litres per second (or min)	$l\,s^{-1}$ or $l\,min^{-1}$
Force	F	newton	N
Frequency of regular event	F	hertz	Hz
Length	L	metre	m
Mass	M	gram	g
Power	$\dot{W}$	watt	W
Pressure (or partial pressure)	P†	pascal*	Pa
Radioactivity		becquerel or curie	Bq (60 d.p.m.) or Ci (3.7×10^{10} Bq)
Resistance (electrical)	R	ohm	Ω
Temperature	T	degree celsius	°C
Time	t	second (preferred)	s
		minute	min
		hour	h
Volume (blood or other liquid)	Q†	litre	l
Volume (air or other gas)	V†	litre	l
Work	W	joule	J

*mm of mercury (mmHg) are allowed if conventional, and if mercury manometer is used for calibration. SI equivalents should be given (1mmHg ≈ 133 Pa).
†may be used with suffixes to denote where and what.

Chemical and Biological Abbreviations

The abbreviations listed may be used without definition *except* those for chemicals, drugs and enzymes which must be written in full at first mention in the title, summary and again in the text. At first mention they should be followed by the abbreviation in brackets. Subsequently, the abbreviation alone may be used.

The list of abbreviations for chemical, drug and enzyme names is clearly not comprehensive and includes only a few commonly used examples.

Use abbreviations sparingly as extensive use can make the text hard to follow.

acetylcholine	ACh	adrenaline	Ad
acetylcholine esterase	AChE	analytical standard of reagent purity	A.R.
adenosine 3′:5′-cyclic monophosphate	cyclic AMP	anhydrous	anhyd.
adenosine 5′-phosphate	AMP	approximate(ly)	approx.
adenosine triphosphatase	ATPase	approximately equals	≈

aqueous	aq.
boiling point	b.p.
bovine serum albumin	BSA
British National Formulary	B.N.F. (with date)
British Pharmaceutical Codex	B.P.C. (with date)
British Pharmacopoeia	B.P. (with date)
cardiovascular system	CVS
catechol-*O*-methyl transferase	COMT
central nervous system	CNS
cerebrospinal fluid	CSF
chi-squared (statistics)	χ^2
clearance	*c*
coenzyme A	CoA
concentrated	conc.
corrected	corr.
cubic	cu.
date: year, month, day	e.g. 1983-02-22.
degree of freedom (statistics)	d.f.
deoxyribonucleic acid	DNA
deoxyribonuclease	DNase
dextro-(absolute configuration)	D-
dextro-(optical rotation)	(+)-
diameter	diam.
diameter, inside	i.d.
diameter, outside	o.d.
diffusion coefficient	*D*
3,4-dihydroxyphenylalanine	DOPA
3,4-dihydroxyphenylethylamine	dopamine
direct current	d.c.
disintegration per minute	d.p.m.
dissociation constant	K_D
dissociation constant, negative logarithm of	pK
distilled	dist.
dry ice	solid CO_2
edition	edn
editor(s)	ed.
effective dose, median	ED_{50}
electrocardiogram	ECG
electrocorticogram	ECoG
electroconvulsive therapy	ECT
electroencephalogram	EEG
electromyogram	EMG
electron spin resonance	e.s.r.
electroretinogram	ERG
equilibrium constant	*K*
equivalent (general use)	equiv.
erythrocyte sedimentation rate	ESR
ethylenediaminetetracetic acid	EDTA
experiment	expt
experimental	exptl
extracellular fluid	ECF
fatty acids, nonesterified	NEFA
figure(s) (with reference number)	Figure(s)
figure (diagram)	figure
γ-aminobutyric acid	GABA
gas–liquid chromatography	g.l.c.
glomerular filtration	GFR
haemoglobin	Hb
half-life	$t_{\frac{1}{2}}$
high frequency	h.f.
high performance liquid chromatography	h.p.l.c.
human serum albumin	HSA
hydrogen-ion concentration	$[H^+]$
hydrogen-ion activity, negative logarithm of (hydrogen-ion exponent)	pH
6-hydroxydopamine	6-OHDA
5-hydroxyindoleacetic acid	5-HIAA
5-hydroxytryptamine	5-HT
immunoglobulins	IgA, IgD, IgE, IgG, IgM
inhibitor constant	K_i
insoluble	insol.
international unit	iu
intra-arterial	i.a.
intracellular fluid	ICF
intradermal	i.d.
intramuscular	i.m.
intraperitoneal	i.p.
intracerebroventricular	i.c.v.
intravenous	i.v.
isotope (atomic mass) e.g. iodine-131	^{131}I
isotopically substituted compounds e.g.	[^{14}C]-ethanol
laevo-(absolute configuration)	L-
laevo-(optical rotation)	(−)-
lethal dose, median	LD_{50}
logarithm to base e	$\log_e$ or ln
logarithm to base 10	$\log_{10}$
maximum	max.
mean arterial pressure	MAP
mean value of (statistics)	$\bar{x}$
melting point	m.p.
meta	*m*-
Michaelis constant	K_M
minimum	min.
mobility (electrophoresis)	*m*
molecular weight (molecular mass)	see relative molecular mass
monoamine oxidase	MAO
noradrenaline	NA

nuclear magnetic resonance	n.m.r.
number	no.
number of observations (statistics)	*n*
ortho	*o*-
packed cell volume	PCV
page/pages	p./pp.
para-	*p*-
paragraph	para. or ¶
parts per million	p.p.m.
per cent	%
posterior	post.
probability (significance level in a statistical test)	*P*
rectus (configuration by the sequence rule)	**R**
red blood corpuscle	RBC
relative band speed to front (chromatography)	R_F
relative molecular mass	M_r
relative retention time (gas chromatography)	t_r
renal plasma flow	RPF
resistance (respiratory)	*R*
respiratory exchange ratio	R
revolutions per minute	r.p.m.
ribonucleic acid	RNA
section	§
sedimentation coefficient (ultracentrifugation)	*s*
sinister (configuration by the sequence rule)	**S**
soluble	sol.
solution	soln.
standard deviation: (of observed sample)	s.d.
standard error (of estimate mean value)	s.e.mean
standard error (of sampling)	s.e.
standard temperature and pressure	STP
subcutaneous	s.c.
sum (statistical):	
of hypothetical population	$\boldsymbol{\Sigma}$
of observed sample	S or $\boldsymbol{\Sigma}$
temperature	temp.
thin layer chromatography	t.l.c.
time clock-24 h clock used e.g. 18 h 30 min	*t*
2-amino-2-hydroxymethyl-propan-1,3-diol	Tris
ultraviolet	u.v.
unit	u
vacuum	vac.
valency	e.g. Fe^{2+}; Fe(II) protoporphyrin
volume by volume	v/v
wavelength	λ
weight	wt.
weight by volume	w/v

References

1. Policy of the Journal and Instructions to Authors. *Biochem. J.* (1983). **209,** 1–27.
2. International Anatomical Nomenclature Committee (1966). *Nomina Anatomica. 3rd edn. Amsterdam: Excerpta Medica* Foundation.
3. Breed, R.S., Murray, E.G.D. & Smith, N.R. (1957). *Bergey's Manual of Determinative Bacteriology* 7th edn. London: Baillière, Tindall & Cox.
4. Typography of bacteria. *Nature, Lond.* (1965). **208,** 332.
5. IUPAC-IUB Combined Commission on Biochemical Nomenclature (1966). Abbreviations and symbols for chemical names of special interest in biological chemistry: revised tentative rules. *Biochem. J.* (1966). **101,** 1–7.
6. Instructions to authors. *Br. J. Haematol.* (1970). **18,** 3–12.
7. *Handbook for Chemical Society Authors* (1961). Special publication No. 14. London: Chemical Society.
8. *Enzyme Nomenclature.* Recommendations (1984) of the International Union of Biochemistry. Amsterdam: Elsevier.
9. International Union of Physical Sciences (1965). *Symbols, Units and Nomenclature in Physics.* IUP document 11. Geneva: UNESCO.
10. Royal Society (1971). *Quantities, Units and Symbols.* London: Royal Society.
11. Otis, A.B. (1964). *Handbook of Physiology.* Section 3, Respiration. Vol. 1, Ch.27. Quantitative relationships in steady-state gas exchange. ed. Fenn, W.O. & Rahn, H. pp. 681–698. Washington: American Physiological Society.
12. Standing Committee on Publications of the British Psychological Society (1967). *Suggestions to Authors.* London: Cambridge University Press.
13. Baron, D.N., Moss, E.W., Walker, P.G. & Wilkinson, J.H. Abbreviations for names of enzymes of diagnostic importance. *J. clin. Path.* (1971). **24,** 656–657.
14. International Union of Pure and Applied Chemistry (1969). *Manual of Symbols and Terminology for Physicochemical Quantities and Units.* London: Butterworths.
15. Directions to contributors. *J. Endocrinol.* (1980). **84,** 1–8.
16. Abbreviated nomenclature of synthetic polypeptides. *Biochem. J.* (1972). **127,** 753–756 and Nomenclature of peptide hormones. *Biochem. J.* (1975). **151,** 1–4.
17. Instructions to Authors. Table IV Symbols for amino acids. *J. biol. Chem.* (1983). **258,** 8.
18. Notice to Contributors. *J Physiol.* (1983). **339,** iii–viii.