Experimental Physiology

Scope

Experimental Physiology publishes the following types of papers:

(i) **Full-length Papers** which report the results of original research
(ii) **Rapid Communications** which report research that merits accelerated publication
(iii) **Review Articles** which discuss critically and concisely current developments of interest to physiologists. These are normally limited to about twenty printed pages and are solicited from prospective authors by editors
(iv) **Mini Review Articles,** which are generally solicited by the Editors from physiologists at a relatively early stage in their career, discuss concisely topics of interest to other physiologists. These are limited to 3500 words.
(v) **Symposium Papers** which report concisely presentations given as part of symposia at scientific meetings of The Physiological Society. Symposium Papers can take one of two forms: either similar to Mini Review Articles or similar to Rapid Communications.
(vi) **Book Reviews** which discuss publications of general interest to physiologists. These are invited by the Distributing Editor and are signed by the reviewer.

This notice is posted on the web page http://www.physoc.org/ep where it will be updated during the year.

Policy

Subject areas

Experimental Physiology publishes articles in all areas of physiology with particular emphasis on whole-animal, systems and integrative physiology. Papers on those facets of cellular and molecular biology and gene function especially relevant to the understanding of integrative mechanisms are also welcomed. In addition pertinent methodological papers are encouraged. The journal also publishes invited reviews dealing with rapidly developing areas of physiology or which update understanding of classical fields of physiology.

Editorial procedures

Members of the Editorial Board are responsible for editing a paper r assigning it to an appropriate Expert Referee. It is the policy of *Experimental Physiology* that each paper is independently reviewed by two people, normally the Editor and an Expert Referee; in some cases a second Expert Referee may be consulted. It is the aim of the Editorial Board that authors should receive an Editorial Report within 6 weeks of receipt of the complete manuscript in the Publications Office.

Manuscripts should be clearly marked with one of the subject areas listed below:

	Subject area	Editor(s)
1.	Autonomic neuroscience	J.F.R. Paton/K. Sharkey
2.	Cardiovascular control	R. Dampney/C. Julien
3.	Genomic physiology	C. Bauer

4.	GI and epithelial physiology	R. Dimaline/M.A. Gray
5.	Heart/cardiac muscle	G.I. Smith/D.J. Paterson
6.	Human/exercise physiology	R. Maughan/S.A. Ward
7.	Molecular physiology	D.A. Terrar/R. Dimaline
8.	Muscle physiology	K.W. Ranatunga/P.H. Ellaway
9.	Neuroendocrinology/endocrinology	M.L. Forsling
10.	Neurophysiology	B.M. Lumb/K.Sharkey
11.	Placental-perinatal	L.Poston
12.	Renal physiology	C.J. Lote/M.L. Forsling
13.	Respiratory physiology	P. McLoughlin/S.A. Ward
14.	Somato-sensory and motor physiology	P.H. Ellaway/B.M. Lumb
15.	Vascular physiology	L.Poston/D.J. Paterson

Authors are also encouraged to supply the names of up to three referees.

Overlapping material

Only in exceptional circumstances may results submitted for publication in *Experimental Physiology* repeat findings already published or intended to be published by the authors elsewhere; inclusion on a website of material other than an abstract is considered as prior publication. Authors should instead refer to their precious findings in the same way as they would if the work had come from a different group. This policy applies to results in the widest sense and not simply to figures or parts of figures. The Editorial Board emphasizes that a manuscript which is merely an expanded version of work published elsewhere is not acceptable. An exception to this policy applies in the case of an abstract that does not exceed about 400 words.

A submission must be accompanied by a copy of any of the authors' material that overlaps the content of the manuscript. This should include preliminary notes, communications, abstracts, chapters or reviews, published in the last year, or in press or submitted by any of the authors.

Ethical Standards

Authors should note that the processing of papers may be delayed if there is any doubt about their conformity with the ethical standards required by *Experimental Physiology*.

1. Research misconduct

The Editorial Board is alert to any form of research or publication misconduct including submission of fraudulent data, plagiarism, dual publication and false or incomplete attribution of authorship. It endorses the general principles set out in *Guidelines on Good Publication Practice* produced by the Committee on Publication Ethics (COPE). The *Guidelines* are available on the web on: www.publicationethics.org.uk. Authors should be aware that *Experimental Physiology* will take action along the lines indicated in the COPE *Guidelines* where misconduct is suspected.

2. Animal experiments

The Editorial Board will not allow the publication of papers describing experimental procedures on living animals which may reasonably be presumed to have inflicted unnecessary pain or discomfort upon them.

To be acceptable for publication, experiments on living vertebrates or *Octopus vulgaris* should conform with the principles of UK legislation. Whenever appropriate, a statement should be included indicating that experiments were performed in accordance with national/local ethical guidelines. Authors must give a full description of their anaesthetic and surgical procedures, and of peri-operative care, at every stage (including preparatory stages). For anaesthesia the following details are required: (1) generic name for the anaesthetic; (2) dose and route used; and (3) dose, route and frequency of supplemental doses, plus criteria for giving additional doses when neuromuscular blocking agents are used. Note that chilling is not an acceptable method for rendering cold-blooded vertebrates insentient; an anaesthetic agent must be used. Authors must provide evidence that they took adequate steps to ensure that animals did not suffer

unnecessarily at any stage of an experiment, whether acute or chronic. Where relevant, the fact that animals were killed at the end of an experiment should be stated.

Authors working on isolated tissues, including primary cell cultures, must state whether the donor animal was anaesthetized or killed, and give details of the relevant procedures. Where tissues are obtained from an abattoir or similar establishment the method of killing need not be specified unless scientifically important.

Guidelines for the conduct of experiments
Use of neuromuscular blocking agents and of nitrous oxide

In experiments involving the use of neuromuscular blocking agents authors must describe the precautions taken to ensure the adequacy of anaesthesia. They must also provide sufficient detail to enable the reader to determine that no unnecessary suffering occurred. The Physiological Society has issued the following advice:

'When neuromuscular blocking agents are used with anaesthetic agents during physiological experiments, safeguards are required to ensure that the animal does not experience unnecessary pain or distress. It is the responsibility of the person conducting the experiment to ensure that anaesthesia is adequate. Neuromuscular blocking agents should never be used without anaesthesia.

1. For any experiment using neuromuscular blocking agents it should first be established that the proposed anaesthetic regime is adequate, in the absence of these agents, to provide analgesia for any surgical procedure or noxious stimulus which is proposed. When light levels of anaesthesia are considered appropriate for experimental purposes, it should have been established that deeper levels of anaesthesia would interfere with the purpose of the experiment. All preparatory major surgery should be performed under full surgical anaesthesia. Subsequent procedures under light anaesthesia in the presence of neuromuscular blocking agents should be conducted in such a way that any residual pain from the initial surgery is blocked by local anaesthetics or analgesia and no further noxious stimuli are delivered. It should be noted that some methods of head holding using ear bars and zygomatic bars are a potential source of pain: other, atraumatic, methods of head restraint should be used in lightly anaesthetized animals.

2. During the course of each experiment in the period when neuromuscular blocking agents are used there must be a protocol for continuous or regular assessment of adequacy of anaesthesia. The appropriate methods of assessment will depend on the particular anaesthetic and to the particular experiment. For example:

(a) the monitoring of changes in heart rate and blood pressure provides one of the most valuable indices of the level of anaesthesia. Neuromuscular blocking agents, in doses which do not reduce blood pressure, do not abolish autonomic cardiovascular reflexes. A preparation in which precipitate cardiovascular responses occur to minor noxious stimuli must be considered too lightly anaesthetized;
(b) the electroencephalogram can be monitored and changes in pattern with minor noxious stimuli may be a valuable guide. Thus, many experiments can be conducted while the EEG is in the unaroused state characteristic of moderate anaesthesia. However, some anaesthetics (e.g. chloralose) induce an EEG that cannot be readily interpreted, and the relation between EEG waveform and the suffering of pain is, in any case, not known. It should also be noted that changes in arterial P_{CO2} and the administration of atropine and certain other drugs may alter the relation between the EEG and behavioural state;
(c) the state of the pupil can provide a further indication of the level of anaesthesia. Generally, under anaesthesia pupils are constricted, and dilated pupils, or pupils which react rapidly to stimuli, are indicative of inadequate anaesthesia. This is not a suitable test for experiments on the visual system when drugs have been administered which paralyse accommodation and dilate the pupils.

3. Nitrous oxide (N_2O) has effective mood changing (tranquilizing) and analgesic properties and is useful because of the ease and consistency of delivery but, even at the maximum concentration feasible at normal pressures, it is not an adequate anaesthetic for surgery in cats. Caution should be used in relying upon it for maintenance, even when precautions have been taken to avoid noxious stimuli. It becomes especially important to assess the animal's state periodically and to use supplementary agents as required.'

3. Human experiments

The Editorial Board is concerned that all work published in *Experimental Physiology* should have been conducted according to the highest standards of safety and ethics. Legislation and accepted practice concerning human experimentation vary from country to country and consequently it is difficult to define absolute requirements. However, work with human subjects should conform to the standards set by the Declaration of Helsinki (last modified in 1996), the Medical Research Council's pamphlet *Responsibility in Investigations on Human Participants and Material and on Personal Information* (1992), and the guidelines set out below. The objectives must be to ensure that all risks are minimized and that subjects are not injured and do not feel they have been abused as a result of participating in the study. Any definition of abuse will include excessive or unexpected pain or discomfort experienced during the experiment. Note, in the case of experiments involving minors, any risks must have been considered absent or minimal, and evidence must be presented that the experiments were performed with the understanding and consent of the legal guardian.

All manuscripts must contain statements indicating that informed consent has been obtained, preferably in writing, studies have been performed according to the Declaration of Helsinki, and the procedures have been approved by the local ethics committee.

1. The acceptability of procedures used will depend on the age and health of the subjects. Manuscripts should state the age, sex, health status and, where necessary, fitness of participants.
2. 'Informed' consent means that subjects have been told not only of the procedures and risks from the experiment but also that they are free to withdraw at any time without jeopardy. Experiments with children must have, in addition to the acquiescence of the child, the informed consent of the parent or guardian.
3. Experiments must be conducted by suitably qualified personnel with medical support where appropriate. The possible adverse physical and psychological effects of invasive procedures, painful stimuli, the stress of physical performance, sleeplessness, confinement or sensory deprivation must be borne in mind.
4. Monetary or other rewards are commonly provided in physiological studies that involve discomfort. Such rewards should not be so large as to induce subjects to participate against their better judgement. Particular care should be taken to ensure that students and junior laboratory personnel are not inadvertently coerced to participate by senior staff.
5. When drugs are to be given to a subject, their usual actions and potential side-effects must be explained verbally, and, when appropriate, in writing.
6. It is the duty of the experimenter to minimize the physical risks to the subject. Such precautions will depend on the type of experiment: examples include having stops on mechanical devices, limiting the electric current provided by nerve stimulators and providing resuscitation facilities where necessary. Where procedures involve the sampling of body fluids suitable aseptic conditions must be used.
7. Procedures involving exposure to radiation should be detailed separately in the manuscript and include a statement of the dose given.
8. The identity of subjects must remain confidential; only with the written consent of the subject may his or her name be revealed.
9. Before human biopsy or post-mortem tissue is taken for study, consent must be obtained from the subject, or relatives where appropriate. This should be stated in the manuscript.

Copyright and reproduction

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Administrative Procedures

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Manuscripts should be clearly marked with one of the subject areas chosen from the list. Authors are encouraged to supply the names of up to three referees.

Initially one complete typed copy and an electronic version, either a disk or an email attachment, are required. *This must be accompanied by a completed copy of the submission checklist plus copyright declaration* (pp. vii-viii); copies of any other relevant documents must be included.

To accelerate the reviewing process, authors should include a disk or, preferably, a PDF file when submitting a manuscript. Note: PDF files are not suitable for the production stage. Authors returning accepted manuscripts will be asked to include a word-processing file on disk. Desktop publishing (DTP) packages are *not* suitable except where they are able to produce plain ASCII, RTF, TXT or WP files.

Correspondence

Following submission of a manuscript, all correspondence, up to the stage of acceptance, is dealt with by the Distributing Editor whose name, address, and telephone and fax numbers are given in the letter of acknowledgement. After acceptance all matters related to printing should be addressed to the Secretary of the Editorial Board at the Publications Office.

The Editors cannot accept responsibility for damage to or loss of papers submitted to them. Contributors are advised to keep copies of the typescript and illustrations.

Date of receipt

The date of receipt of each paper will be printed and is normally the date on which the manuscript is first received in the Publications Office. Papers submitted without all the information specified in these instructions will not be given editorial consideration until it has been provided; this applies especially to aspects of animal welfare/ethics. The date of receipt published will then refer to the date when a complete submission is received. If an author fails to deal with requested revisions within a reasonable time (usually 3 months) the date of original receipt will be replaced by the date on which the new version was received in the Publications Office.

Rapid communications

The Rapid Communications section is designed for manuscripts of high scientific quality, not more than four pages long including illustrations and tables.

1. Editorial procedure. Papers are refereed and are accepted for rapid publication on the basis of scientific merit and clarity. Essentially, Editors either accept or reject a paper largely as it stands. Trivial editorial changes are not referred to authors, but they will be contacted to clarify scientific queries. Publication could be delayed if authors do not respond immediately.
2. Speed of publication. Deadlines for the receipt of Rapid Communications are shown near the front of each issue of this journal. A paper submitted by the given date will, if accepted, be published approximately 2.5 months from that date in the issue specified.
3. Length. A Rapid Communication may not include more than two illustrations or two tables or one of each. The entire paper, including the title, authors' names and addresses, text, illustrations, tables, legends, acknowledgements and references must not occupy more than 2500 words.

Authors must state at the bottom of the title page and in the covering letter that they wish the manuscript to be considered as a Rapid Communication for accelerated publication.

Proofs

Proofs should be corrected and returned promptly since publication is in order of receipt of corrected proofs. Excessive alterations by the authors of the accepted copy may be subject to further editorial consideration and may be charged to the authors.

Offprints

Authors are provided with a copy of the journal free of charge. Reprints can be supplied if ordered and paid for at the same time as the proofs are returned. An order form will be sent to authors with the proofs. Reprints will normally be despatched by surface mail within 3 weeks of publication of the volume in which the paper appears.

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Preparation of Manuscripts

General information

Papers must be typewritten, on one side of the page only, with double spacing, on numbered sheets of good-quality paper of uniform size. This applies to all sections of the paper including Methods, References, figure legends and tables. English spelling (as in *The Chambers Dictionary*) and terminology should be used (e.g. *colour, fibre, noradrenaline*). Clarity of expression and conciseness will be taken into consideration.

Arrangement of papers

The usual format is:

1	Title page	6	Discussion
2	Summary	7	References
3	Introduction	8	Acknowledgements
4	Methods	9	Figures and legends
5	Results	10	Tables

Papers deviating from the usual format can be considered for publication if there are obvious and compelling reasons for the variation. Small print may be used sparingly. Footnotes are not acceptable.

1. Title page

The title should be on a separate sheet with the authors' names and addresses. The name, address, telephone and fax numbers, and email address of the author dealing with correspondence and proofs must be included.

The title of the paper should be as informative as possible, but should also be concise. The animal species should normally appear in the title. The Editors will not accept a series of papers with the same main title, e.g. 'Studies in…Part I', 'Studies in…Part II'. For abbreviations that are acceptable in the title go to http://www.physoc.org/ep/

A running title not exceeding 45 characters and spaces must be give for page headings.

2. Summary

Each research paper, but not review articles, must start with a Summary not exceeding 5% of the length of the paper. It should consist of a single paragraph, not numbered subsections; text for the Summary will appear in bold. Review articles must have an initial Table of Contents and final Summary. References may not be cited.

Since the Summary may be used by abstracting journals, a limit of 250 words is recommended. It must not exceed 5% of the text (excluding references and figure legends), with an absolute maximum of one printed page.

3. Introduction

The Introduction should make the background and the object of the research clear, and be understandable to the non-specialist. Reference to the authors' previous work is desirable only if it has a direct bearing on the subject of the paper; an extensive historical review is not appropriate.

4. Methods

Methods are described once only and do not appear in the legends to figures and tables. Details should be sufficient to allow the work to be repeated by others. Where appropriate, lists of solutions, chemicals and equipment, and an explanation of data handling procedures may be given as separate headed paragraphs. The maker's name should be given for all non-standard chemicals, apparatus and equipment. Materials known by a trade name, e.g. Perspex, have the initial letter as a capital. The Latin names of non-mammalian species should be given.

Where experiments involve the use of animals or humans authors must consult the 'Guidelines for the conduct of experiments' and must ensure that all the details concerning anaesthesia are given; the use of decerebrate animals should be justified. Where relevant, the fact that animals were humanely killed at the end of an experiment must be stated. Authors must specify that the work conformed with national/local ethics committee guidelines.

All anaesthetic details, including method of killing, must be included for each manuscript. It is not sufficient to refer back to a previous paper for details.

5. Results

Quantitative observations are often better presented graphically than in tables. Authors should ensure that their data are treated correctly, taking statistical advice if necessary. Analysis of variance (ANOVA), not *t* tests, should be used for multiple comparisons; parametric and non-parametric statistics should be used appropriately, and particular care should be taken over the expression of means and errors where data have been transformed onto a logarithmic scale. Standard deviations and standard errors of the means (as appropriate) should be given with not more than two significant figures; the form used, and the *n* value, should be stated. Tests of significance should be specified in full, e.g. Student's paired *t* test. It is not usually necessary to present the individual results of a large number of repeated tests if the number of measurements is stated. Theory and inference must be clearly distinguished from what was observed, and should not be elaborated upon in this section.

6. Discussion

The Discussion which follows the statement of Results should be separate from it. The assumptions involved in making inferences from the experimental results should be stated. The Discussion should not merely recapitulate the Results. Authors should provide a succinct conclusion to their work.

In appropriate circumstances an Appendix or a Theory section may be accepted where, for example, it is necessary to derive mathematical results required in the paper.

7. References

The paper should conclude with a list of the papers and books cited in the text. Authors should avoid an excessive number of references. Normally about 50 should be adequate (a maximum of 30 references for Rapid Reports is strictly adhered to). Journal titles must be given in full. The order of references is strictly alphabetical, regardless of chronology. The style of citations may be ascertained from papers in a recent volume; attention to punctuation is required. The format for references to papers and books and to chapters in books is as follows:

PATEL, A. & SMITH, F.G. (2000). Renal haemodynamic effects of B_2 antagonist HOE 140 in conscious lambs. *Experimental Physiology* **85**, 811-818.

ADRIAN, E.D. (1932). *The Mechanism of Nervous Action*. Humphrey Milford, London

BUCHAN, A.M.J., BRYANT, M.G., POLAK, J.M., GREGOR, M., GHATEI, M.A. & BLOOM, S.R. (1981). Development of regulatory peptides in the human fetal intestine. In *Gut Hormones*, 2nd edn, ed. BLOOM, S.R & POLAK, J.M., pp. 119-124. Churchill Livingstone, Edinburgh.

In the text, references should be made by giving the author and the year of publication in parentheses, e.g. (Lamb, 1986), except when the author's name is part of the sentence, e.g. 'Lamb (1986) showed that…'. Where several references are given together they are in chronological order, separated by semicolons.

When a paper written by two authors is cited, both names are given; for three or more authors only the first name is given, followed by 'et al.'. Unpublished material may be referred to sparingly in the text, by giving the authors' initials and names followed by 'unpublished observations' or 'personal communication'; such citations should not appear in the list of references. Authors should confirm on their declaration that the wording of any reference to unpublished work is approved by the person concerned. References cited as being 'in the Press' must have been accepted for publication, and the name of the journal or publisher included in the reference list.

8. Acknowledgements

Acknowledgements should be the minimum consistent with courtesy. The wording of acknowledgements of scientific assistance or advice must have been seen and approved by the persons concerned.

9. Figures and legends

Each figure should be given a title and be accompanied by a legend that makes it comprehensible without reference to the text, although undue repetition should be avoided. For detailed instructions for preparation of figures see guidelines for preparing figures and tables available on the website (http://www.physoc.org/ep/).

Authors may submit coloured illustrations whenever they enhance the scientific value of the paper. Authors will normally be expected to contribute about half to the actual cost (this contribution will be in the order of £400, £600, £700 and £750 for 1,2,3 and 4 figures, respectively). Enquiries should be addressed to the Publications office.

10. Tables

Tables should be used sparingly. They should be typed double-spaced on separate numbered sheets and referred to in the text by Arabic numerals, e.g. Table 3. Each table should have its own self-explanatory title. The same information should not be presented in both tabular and graphical forms. At the acceptance stage, authors will be asked to provide a separate ASCII file for each table. For preparation of tables see guidelines for preparing figures and tables available on the web site (http://www.physoc.org/ep/).

Abbreviations

Authors should avoid abbreviations unless they are easily understood and help in reading the paper. Abbreviations should be defined when first introduced and are normally printed in upper-case letters without stops (a list of preferred abbreviations is available on the web site (http://www.physoc.org/ep/)).

Symbols, units and mathematical notation

Recommended mathematical symbols and ways of printing them are given in *Quantities, Units, and Symbols* (1975), published by the Royal Society, London; this also includes a full discussion of the use of units.

The SI system of units and index notation should be used, e.g. ml s^{-1} rather than ml/s. Certain traditional units that are still common usage are also acceptable, for example:

length, Å (SI unit nm)

pressure, mmHg, Torr (SI unit kPa)

radioactivity, Ci=Curie (SI unit Bq)

O_2 uptake and CO_2 elimination, 1 min^{-1} (SI unit mol s^{-1}).

Authors should ensure that consistency is maintained throughout the manuscript, including illustrations and tables.

Chemical and biological nomenclature

In general, the conventions in chemical nomenclature adopted by the Biochemical Society should be followed. These are described in the *Biochemical Journal* Instructions to Authors available online from www.BiochemJ.org

Names of species and genera should be in italics (or underlined). Names of muscles, bones etc. should be in roman type (i.e. not in italics).