DESCRIPTION

Academic and scholarly abstracted journal publishing worldwide clinical and basic research in the field of Physical and Rehabilitation Medicine.

Annals of Physical and Rehabilitation Medicine publishes original peer-reviewed clinical and research articles, epidemiological studies, new methodological clinical approaches, review articles, editorials and guidelines.

Annals of Physical and Rehabilitation Medicine covers all areas of Rehabilitation and Physical Medicine; such as: methods of evaluation of motor, sensory, cognitive and visceral impairments; acute and chronic musculoskeletal disorders and pain; disabilities in adult and children; processes of rehabilitation in orthopaedic, rheumatological, neurological, cardiovascular, pulmonary and urological diseases.

Official Journal of the French Society of Physical Medicine and Rehabilitation (Société Française de Médecine Physique et de Réadaptation, SOFMER)

One of the Journals of the UEMS PRM Section. Published in association with ISPRM.

6 issues/year

Indexed in all major international databases. 2018 Impact Factor: 4.196 Rank 2/65, 2018 Journal Citation Reports (Clarivate Analytics, 2019)

AUDIENCE

All people interested in Rehabilitation

IMPACT FACTOR

2018: 4.196 © Clarivate Analytics Journal Citation Reports 2019
ABSTRACTING AND INDEXING

Hinari
Current Contents - Clinical Medicine
Embase
PubMed/Medline
Science Citation Index Expanded
SCImago Journal Rank (SJR)

EDITORIAL BOARD

Editor-in-chief
Dominic Pérennou, University Hospital Centre Grenoble-Alpes Department of Physical Medicine and Rehabilitation, Grenoble, France
Area of expertise: Motricity (Neurological Conditions in Adults: stroke, Parkinson’s disease, multiple sclerosis, neuromuscular disorders)

Editors
Philippe Azouvi, Hospital Raymond-Poincare Department of Rehabilitation Medicine and Pediatric Readaptation, Garches, France
Area of expertise: Neuropsychology and Neuroepidemiology
Helena Burger, SOCA University Rehabilitation Institute, Ljubljana, Slovenia
Area of expertise: Orthotics and Prosthetics, Amputees
Jean-Marie Casillas, University Hospital Centre Dijon, Dijon, France
Area of expertise: Cardiovascular
Emmanuel Coudeyre, University Hospital Centre Clermont-Ferrand, Clermont Ferrand, France
Area of expertise: Osteoarticular
Pierre Denys, Hospital Raymond-Poincare Department of Rehabilitation Medicine and Pediatric Readaptation, Garches, France
Area of expertise: NeuroUrology & Neurosexology, Spinal Cord Injury
Sylvie Nadeau, University of Montreal, School of Rehabilitation (physical therapy), Montreal, Canada
Area of expertise: Neuro-motricity
François Rannou, Rene Descartes University Department of Rheumatology, Rehabilitation Unit, Cochin Hospital, Paris, France
Area of expertise: Osteoarticular

Scientific Committee
Gérard Amarenco, Hospital Rothschild, Paris, France
Johann Beaudreuil, Hospital Group Saint-Louis Lariboisiere and Fernand-Widal, Paris, France
Kim Bennell, The University of Melbourne, Melbourne, Australia
Djamel Bensmail, Versailles Saint-Quentin-en-Yvelines University, Versailles, France
François Béthoux - Director of Rehabilitation Service, Mellen Center for MS Treatment and Research - Cleveland Clinic Foundation, Cleveland, United States
Isabelle Bonan, French National Institute for Health and Medical Research of Rennes, Rennes, France
Paul Calmels, Jean Monnet University, Saint-Etienne, France
Stéphanie Clarke - Director of Neuropsychology and Neurorehabilitation Service, Lausanne University Hospital Centre (CHUV), Lausanne, Switzerland
Patrick Dehail, University Hospital Centre Bordeaux, Bordeaux, France
Maxime Dougdos, Hospital Cochin, Paris, France
Michael Fredericson, STANFORD UNIVERSITY SCHOOL OF MEDICINE, Stanford, United States
Jean-Michel Gracies, Hospital Henri Mondor, Creteil, France
Yves Henrotin, University of Liege Institute of Pathology Bone and Cartilage Research Unit, Liège, Belgium
David Hunter, The University of Sydney, Sydney, Australia
Marta Imamura, University of Sao Paulo, São Paulo, Brazil
Pierre-Alain Joseph, University Hospital Centre Bordeaux, Bordeaux, France
Hans Krebs, Boston University, Boston, United States
Gert Kwakkel, Department Rehabilitation Medicine of the VU University Medical Centre in Amsterdam, Amsterdam, Netherlands
Isabelle Laffont, University Hospital Centre Montpellier, Montpellier, France
Sébastien Laporte, Arts and Crafts ParisTech, Paris, France
Marie-Martine Lefevre-Colau, Hospital Cochin, Paris, France
Thierry Lejeune, ULM Faculty of Motor Sciences, Brussels, Belgium
Jan Lexell, Lund University, Lund, Sweden
Jacques Luaute, Henry Gabrielle Hospital, St Genis Laval, France
Philippe Marque, University Hospital Centre Toulouse, Toulouse, France
Antonio Nardone, Foundation Salvatore Maugeri Scientific Institute of Rehabilitation of Veruno, Veruno, Italy
Christelle Nguyen, University of Paris, Paris, France
Jean Paysant, Department of Physical Medicine and Rehabilitation Nancy Regional University Hospital Center, Nancy, France
Brigitte Perrouin-Verbe, Hospital University Centre Nantes (CHU), Nantes, France
Pascale Pradat-Diehl, Sorbonne University, Paris, France
Olivier Remy-Neris, University and Regional Hospital Centre Brest, Brest, France
Agnès Roby-Brami, Pierre and Marie Curie University, Paris, France
Gilles Rode, University Claude Bernard Lyon 1, Lyon Cedex, France
Yves Rossetti, University Claude Bernard Lyon 1, Lyon Cedex, France
Mathieu de Seze, University Hospital Centre Bordeaux, Bordeaux, France
Cathy Stinear, The University of Auckland, Auckland, New Zealand
André Thévenon, Regional and University Hospital Centre Lille, Lille, France
Philippe Thoumie, Hospital Rothschild, Paris, France
Vincent Tiffreau, Regional and University Hospital Centre Lille, Lille, France
Eric Verin, University Hospital Centre Rouen, Rouen, France
Alain Yelnik, Hospital Group Saint-Louis Lariboisiere and Fernand-Widal, Paris, France
INTRODUCTION

Annals of Physical and Rehabilitation Medicine (APRM) is a scientific journal created in 2009 from the existing Annales de Réadaptation et de Médecine Physique. It is published in English and covers all fields and aspects of Physical Medicine and Rehabilitation, from basic, to medical and social sciences related to rehabilitation.

Annals of Physical and Rehabilitation Medicine is published in association with the International Society of Physical and Rehabilitation Medicine (ISPRM). In addition, it is one of the Official journals of the Physical and Rehabilitation Medicine section of the European Union of Medical Specialists (UEMS) and is the official organ of the Société Française de Médecine Physique et de Rédaptation (SOFMER). The Journal is indexed in MEDLINE. SCImago Journal Rank (SJR) covers the journal, which is ranked in the second quartile of the 'Rehabilitation' category as well as the 'Orthopaedics and Sports Medicine' category. SJR indicators for APRM are improving regularly. Also increasing is the number of citations per document recently published in the journal.

Publication in the Annals of PRM is free of charge.

The Editorial policy of the Journal is to publish papers respecting the ethical principles of the Helsinki statement (1964). Papers must deal with one of the following fields:

- Assessment methods of motor, sensory, cognitive and visceral impairments
- Functional disabilities in children, adult, and elderly
- Clinical applications and research about handicap epidemiology and the International Classification of Functioning, Disability and Health
- Rehabilitation technics and programs as well as technological innovations to reduce the handicap in cardiovascular, neurological, orthopaedic, pulmonary, rheumatological, and urological diseases
- Evidence-based-medicine applied for non-pharmacological treatments, and drugs used in rehabilitation
- Elaboration of clinical recommendations in the field of rehabilitation
- Submission of papers dealing with interventions in rehabilitation is especially encouraged.

To ensure the quality of the disability and rehabilitation research submitted for publication, the Annals of PRM invite authors to follow guidelines (CONSORT and non-pharmacological CONSORT for randomized controlled trials; STROBE for observational studies; PRISMA for systematic reviews and meta-analyses; STARD for studies of diagnostic accuracy; CARE for case reports; and ARRIVE for animal studies), and to register their study in international databases.

An international editorial board and a panel of reviewers, all well recognized in their respective fields, help authors improve the quality of their papers. The editorial process is kept as short as possible: in 2014 and 2015, the mean time to reach the first decision was one month for manuscripts submitted.

The Annals of PRM publish six issues per year, including alternatively 2 or 3 thematic issues (invited authors) and 3 or 4 regular issues. At the discretion of the editor in chief, some papers are posted with immediate free access. All papers are available with free access after one year. The papers published in the Annals of PRM are increasingly popular, as shown by the recent statistics of the ScienceDirect downloads. In 2015, the articles of the Annals of PRM were downloaded 36,000 times every month, all over the world, with North America: 40%, Western Europe: 30%, Asia: 12%, Australasia 6%, South America: 5 %, Eastern Europe: 4%, Africa: 3%.

Types of article

Specifications for Manuscript Categories

Manuscript type Word Count

Excluding abstracts, tables, figure legends, references Abstract References Figures/Tables

Original Articles ≤ 3500 + supplemental material online ≤ 300 ≤ 40 ≤ 6 Reviews - Update papers - Position papers ≤ 4000 + supplemental material online ≤ 300 ≤ 60 ≤ 8 Short reports ≤ 1800 + supplemental material online ≤ 250 ≤ 20 ≤ 4 Letters to editor

Including case reports, comments on, clinical/scientific Notes etc.. ≤ 1500 None ≤ 12 ≤ 3 Editorials ≤ 1200 None ≤ 12 ≤ 3

The length of each manuscript must be given on the title page, including a word count for the abstract, the main text, as well as the number of tables, figures and references.

Original articles
Articles are full-length reports of original research. These include large-scale pivotal trials of new therapies (randomized clinical trials). According to ClinicalTrials.gov, clinical trials "are generally considered to be biomedical or health-related research studies in human beings that follow a predefined protocol". ClinicalTrials.gov includes both interventional and observational types of studies. Interventional studies are those in which the research subjects are assigned by the investigator to a treatment or other intervention, and their outcomes are measured. Observational studies are those in which individuals are observed and their outcomes are measured by the investigators. Original articles report new and original work that has not been published elsewhere (except as an abstract at a conference). The last paragraph of the introduction should state the question(s) of the study, whose answers are found in the results section. The results should be described concisely, with no redundancies between the text and the tables or figures. The discussion should start with a brief summary of the results and an explanation of how the results contribute to answer the study question(s). The discussion should be brief; in general, one-third of the total manuscript length is appropriate.

Specifications:
- A maximum of 3500 words (not including abstract, figure legends, table legends, references). This length equals about 18 double-spaced manuscript pages.
- Structured Abstract containing Objectives (including background), Methods, Results, and Conclusions, maximum 300 words.
- A maximum of 40 references. The best references should be included rather than duplicative citations for single points. Citations to non-peer-reviewed work should be avoided. If additional references are deemed important, they can be published online as supplemental data.
- Limit of 5 figures and tables total. Up to 3 additional figures or tables can be published online. Tables should not repeat data in the text.
- If a table is longer than two double-spaced manuscript pages (including the legend), it will be published online as supplementary material.
- Figure legends must explain what is represented in the figure rather than repeat results, methods, and conclusions.
- If Methods contain widely available, detailed protocols, appropriate portions may be posted online only at the Editor's discretion.

Reviews, update papers, position papers
Reviews and position papers are either a review or an opinion statement that provides a summary of the most important recent information on a topic. Update papers present an update of recent data about a specific topic. Methodologies of review papers must follow some rules regarding the bibliography selection, reading and presentation (Prisma reporting guidelines). If a review summarizes recommendations for practice, use the word "Recommendations" in the title rather than "Guidelines", unless they have been established by a process involving learned societies. The structure of Update articles and position papers may be more flexible.

Specifications:
- A maximum of 4000 words, excluding references
- Abstract (structured optional), maximum 300 words
- A maximum of 60 references (additional references may be added as online supplementary material). They should cite the most important papers in the field.
- No more than 8 tables and/or figures.

Short report (Smaller Scope Studies)
Annals of PRM will consider smaller (e.g., < 40 participants), uncontrolled, nonrandomized, or unblinded clinical trials as short report. This category includes pilot studies with an adequate sample size (>20 participants). These manuscripts should be registered as "Article" by the authors at submission. Editors will make final decisions regarding their length.

Specifications:
- A maximum of 1800 words (not including abstract, figure legends, table legends, references)
- Structured abstract, maximum 250 words.
- No more than 20 references.
- A maximum of 4 tables or figures.

Letters to the editor
Letters to the editor are Clinical/Scientific notes, abbreviated reports on cases or preliminary studies, or comments on a paper published in the Annals of PRM. The writing may be organized in sections, must be fluid without any chapter heading. The introduction and the discussion should be brief and
should point out the originality of the study or the case(s) description, and its contribution to scientific knowledge. No attempt should be made to write a review of the topic. Manuscripts reporting a case with a review of the literature will not be considered.

Specifications:
- A maximum of 1500 words.
- No abstract (the title serves as abstract).
- No more than 12 references.
- No more than 3 tables or figures.

In some cases, the length of a letter to the editor may exceed that mentioned in the Table above, but only with the agreement of the editors.

Editorial
Editorials expound opinions, describe noteworthy facts, summarize prominent studies, report news, or provide perspective. The authors are free to choose the outline. There is no abstract. Although editorials are often commissioned by the Editorial Committee, spontaneous submissions are welcome, with or without a pre-submission inquiry to the editors. In some cases, the length of the editorial can oversize the one mentioned in the Table above, with the agreement of the editors.

Submission checklist
You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:
- E-mail address
- Full postal address

All necessary files have been uploaded:
**Manuscript:**
- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print

**Graphical Abstracts / Highlights files** (where applicable)

**Supplemental files** (where applicable)

For further information, visit our Support Center.

BEFORE YOU BEGIN

Ethics in publishing
Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.

Studies in humans and animals
If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms sex and gender should be used correctly.
Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

All animal experiments should comply with the ARRIVE guidelines and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, EU Directive 2010/63/EU for animal experiments, or the National Institutes of Health guide for the care and use of Laboratory animals (NIH Publications No. 8023, revised 1978) and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

Declaration of interest
All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'Declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. More information.

Submission declaration and verification
Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see 'Multiple, redundant or concurrent publication' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service Crossref Similarity Check.

Preprints
Please note that preprints can be shared anywhere at any time, in line with Elsevier's sharing policy. Sharing your preprints e.g. on a preprint server will not count as prior publication (see 'Multiple, redundant or concurrent publication' for more information).

Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using 'he or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping (e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').

Changes to authorship
Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed. Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.
Copyright
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

For gold open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (more information). Permitted third party reuse of gold open access articles is determined by the author's choice of user license.

Author rights
As an author you (or your employer or institution) have certain rights to reuse your work. More information.

Elsevier supports responsible sharing
Find out how you can share your research published in Elsevier journals.

Role of the funding source
You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

Open access
Please visit our Open Access page for more information.

Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's Author Services.

Submission
Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.

Please submit your article via http://ees.elsevier.com/rehab.

Cover letter
All submissions should also contain a cover letter describing the type of article and specifying the length of the main text and abstract along with the number of tables and figures where applicable. This letter should also include a paragraph in which the authors present the strengths of their study.

Referees
Please submit the names and institutional e-mail addresses of several potential referees. For more details, visit our Support site. Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

PREPARATION
Peer review
This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. More information on types of peer review.

Use of word processing software
It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

Article structure
Subdivision - unnumbered sections
Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line. Subsections should be used as much as possible when cross-referencing text: refer to the subsection by heading as opposed to simply 'the text'.

Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Material and methods
Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

Theory/calculation
A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

Results
Results should be clear and concise.

Discussion
This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Conclusions
The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Appendices
If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information
• Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
• Author names and affiliations. Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation
addresses (where the actual work was done) below the names. Indicate all affiliations with a lowercase superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.

- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**

- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

### Highlights

Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: [example Highlights](#).

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

### Abstract

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

### Graphical abstract

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view [Example Graphical Abstracts](#) on our information site. Authors can make use of Elsevier's [Illustration Services](#) to ensure the best presentation of their images and in accordance with all technical requirements.

### Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using British spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations**

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

**Acknowledgements**

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

**Formatting of funding sources**

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].
It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Units**

Follow internationally accepted rules and conventions: use the international system of units (SI). If other units are mentioned, please give their equivalent in SI.

**Math formulae**

Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

**Footnotes**

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

**Artwork**

**Electronic artwork**

**General points**

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.
- Ensure that color images are accessible to all, including those with impaired color vision.

A detailed guide on electronic artwork is available. **You are urged to visit this site; some excerpts from the detailed information are given here.**

**Formats**

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format. Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

- EPS (or PDF): Vector drawings, embed all used fonts.
- TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.  
- TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.  
- TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.
**Color artwork**
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article.** Please indicate your preference for color: in print or online only. **Further information on the preparation of electronic artwork.**

**Illustration services**
*Elsevier's Author Services* offers Illustration Services to authors preparing to submit a manuscript but concerned about the quality of the images accompanying their article. Elsevier's expert illustrators can produce scientific, technical and medical-style images, as well as a full range of charts, tables and graphs. Image 'polishing' is also available, where our illustrators take your image(s) and improve them to a professional standard. Please visit the website to find out more.

**Figure captions**
Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title **(not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

**Tables**
Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

**References**

**Citation in text**
Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

**Reference links**
Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is highly encouraged.


**Web references**
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.
Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue
Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference style
Text: Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.

List: Number the references (numbers in square brackets) in the list in the order in which they appear in the text.

Examples:
Reference to a journal publication:
Reference to a journal publication with an article number:
Reference to a book:
Reference to a chapter in an edited book:
Reference to a website:
Reference to a dataset:
Note shortened form for last page number. e.g., 51–9, and that for more than 6 authors the first 6 should be listed followed by 'et al.' For further details you are referred to 'Uniform Requirements for Manuscripts submitted to Biomedical Journals' (J Am Med Assoc 1997;277:927–34) (see also Samples of Formatted References).

Journal abbreviations source
Journal names should be abbreviated according to the List of Title Word Abbreviations.

Video
Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file’s content. In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply ‘stills’ with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Supplementary material
Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article
and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

**Research data**

This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.

**Data linking**

If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

**Mendeley Data**

This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to Mendeley Data. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the Mendeley Data for journals page.

**Data statement**

To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the Data Statement page.

**AFTER ACCEPTANCE**

**Online proof correction**

To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors. If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.
We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

**Offprints**
The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier's Author Services. Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

**AUTHOR INQUIRIES**
Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.
You can also check the status of your submitted article or find out when your accepted article will be published.