DESCRIPTION

*JASC* is the official journal of the American Society of Cytopathology and reflects the values and priorities of the society. *JASC* publishes regular bimonthly issues with cutting-edge original research of the highest standard. The Journal seeks to provide an exceptional forum for interaction and dissemination of original research and educational information in the field of cytopathology and other allied disciplines in medicine. The cross-disciplinary focus of the journal ensures the sharing of information with all readers involved in the practice of cytopathology and its related basic sciences, epidemiology and clinical oncologic disciplines.

*JASC* endeavors to have a positive impact not only on all aspects of cancer diagnosis and treatment, but also on other human disease. *JASC* publishes original work emphasizing novel discoveries or clinicopathologic correlations in a patient-centered environment, technological advances in basic and translational research with emphasis on the development of personalized medicine, and new or improved molecular techniques and their novel application for diagnosis or monitoring of disease. Preference is also given to original work demonstrating the scholarship of education in cytopathology including new innovative tools for continuing education and training as well as designing and implementing new assessment and evaluation techniques. It duly addresses and highlights issues relating to population health and public policy topics. It is the goal of *JASC* to lead the discipline of cytopathology by setting professional quality standards ensuring diagnostic excellence, advocating laboratory safety and quality, and inter-professional education for pathologists, cytotechnologists and all allied health care specialties.

ABSTRACTING AND INDEXING

PubMed/Medline

EDITORIAL BOARD

*Editor-in-Chief*
Dina R. Mody, Houston Methodist Hospital, Houston, Texas, United States

*Managing Editor*
Frances Burroughs, Johns Hopkins University, Baltimore, Maryland, United States
Associate Editors
Liron Pantanowitz, University of Pittsburgh Medical Center, Wexford, Pennsylvania, United States
Martha Pitman, MASSACHUSETTS GENERAL HOSPITAL, Boston, Massachusetts, United States
Paul VanderLaan, BETH ISRAEL DEACONESS MEDICAL CENTER, Boston, Massachusetts, United States

Honorary Editor
Syed Ali, Johns Hopkins Medicine, Baltimore, Maryland, United States

Image Editor
Daniel Kurtcz, University of Wisconsin Madison, Wisconsin, United States

Overseas Editors
Andrew Field, Saint Vincent's Health Australia New South Wales, Sydney, Australia
Gary M. Tse, Chinese University of Hong Kong, Hong Kong
Philippe Vielh, National Laboratory of Health, Sceaux, France

Section Editors
Gynecologic Cytopathology
R. Marshall Austin, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, United States
Michael R. Henry, Mayo Clinic Minnesota, Rochester, Minnesota, United States
Ritu Nayar, Northwestern University Feinberg School of Medicine, Chicago, Illinois, United States
Donna K. Russell, University of Rochester Medical Center, Rochester, New York, United States

Non-gynecologic Cytopathology
Fernando C. Schmitt, University of Porto, Porto, Portugal
Momin T. Siddiqui, Weill Cornell Medicine, New York, New York, United States
Christopher J. Vandenbussche, Johns Hopkins Medicine, Baltimore, Maryland, United States

Fine-Needle Aspiration Cytopathology
Michelle Reid, Emory University Hospital, Atlanta, Georgia, United States
Mary R. Schwartz, Houston Methodist Hospital, Houston, Texas, United States
Mary K. Sidawy, Georgetown University Medical Center, Washington, District of Columbia, United States

Molecular and New Techniques
Sarah Kerr, Mayo Clinic Rochester, Rochester, Minnesota, United States
Savitri Krishnamurthy, UNIVERSITY OF TEXAS MD ANDERSON CANCER CENTER, Houston, Texas, United States

Novel Insights from Clinical Practice
Christine N. Booth, Cleveland Clinic Foundation, Rocky River, Ohio, United States
Sara Monaco, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, United States

Legislative and Regulatory Issues
George G. Birdsong, Grady Health System, Atlanta, Georgia, United States
Hormoz Ehy, Fox Chase Cancer Center, Philadelphia, Pennsylvania, United States

Challenges in Cytology Education and Assessment Tools
William N. Crabtree, Indiana University School of Medicine, Indianapolis, Indiana, United States
Lydia P. Howell, University of California Davis Medical Center, Davis, California, United States

Review Article
Stefan E. Pambuccian, Loyola University Medical Center, Maywood, Illinois, United States
Michael J. Thrall, Houston Methodist Hospital, Houston, Texas, United States

Social Media
Maren Fuller, Texas Children's Hospital, Houston, Texas, United States
Kaitlin Sundling, University of Wisconsin-Madison Wisconsin State Laboratory of Hygiene, Madison, Wisconsin, United States

Small Biopsy
Justin A. Bishop, UT Southwestern Medical Center, Clements University Hospital, Dallas, Texas, United States
Vickie Y Jo, Brigham and Women's Hospital, Boston, Massachusetts, United States

Special Issues
Eva M. Wojcik, Loyola University Medical Center, Maywood, Illinois, United States
Editorial Advisory Board

Fadi W. Abdul-Karim, Cleveland Clinic, Cleveland, Ohio, United States
Tatjana Antic, University of Chicago, Chicago, Illinois, United States
Manon Auger, McGill University, Montréal, Quebec, Canada
Zubair W. Baloch, Penn Medicine, Philadelphia, Pennsylvania, United States
Guliz Barkan, LOYOLA UNIVERSITY MEDICAL CENTER, Maywood, Illinois, United States
Jennifer Brainard, Cleveland Clinic, Cleveland, Ohio, United States
Marilyn Bui, MOFFITT CANCER CENTER, Tampa, Florida, United States
Ashish Chandra, Saint Thomas' Hospital, London, United Kingdom
Ivan Chebib, Massachusetts General Hospital, Charlestown, Massachusetts, United States
David F. Chhieng, University of Washington, Seattle, Washington, United States
Deborah Chute, Cleveland Clinic, Cleveland, Ohio, United States
Edmund S. Cibas, Brigham and Women's Hospital, Boston, Massachusetts, United States
Douglas P. Clark, University of New Mexico, Albuquerque, New Mexico, United States
Chyi C. Chiang, University of Central Florida College of Medicine, Orlando, Florida, United States
Diane D. Davey, University of Central Florida College of Medicine, Orlando, Florida, United States
Leslie G. Dodd, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, United States
Tarik M. Elsheikh, CLEVELAND CLINIC FOUNDATION, Cleveland, Ohio, United States
Isam A. Eltoum, The University of Alabama at Birmingham, Birmingham, Alabama, United States
Fang Fan, University of Kansas Medical Center, Kansas City, Kansas, United States
Armando C. Filie, National Cancer Institute, Bethesda, Maryland, United States
Andrew Fischer, UMass Memorial Health Care, Worcester, Massachusetts, United States
Maria A. Friedlander, Memorial Sloan Kettering Cancer Center, New York, New York, United States
Nora Frisch, University at Buffalo Pathologists Inc, North Tonawanda, New York, United States
Yimin Ge, METHODOIST HOSPITAL, Houston, Texas, United States
Blythe Gorman, METHODOIST HOSPITAL, Houston, Texas, United States
Abha Goyal, Weil Cornell Medicine, New York, New York, United States
Ming Guo, University of Texas MD Anderson Cancer Center, Houston, Texas, United States
Prabodh K. Gupta, Penn Medicine, Philadelphia, Pennsylvania, United States
Steven I. Hajdu, Pathology Consultants, Westlake Village, California, United States
Soon Won Hong, Yonsei University, Seoul, Korea, Republic of
Darshana N. Jhala, Penn Medicine, Philadelphia, Pennsylvania, United States
Nirag C. Jhala, TEMPLE UNIVERSITY HOSPITAL, Philadelphia, Pennsylvania, United States
Wald E. Khalbous, King Abdulaziz Medical City, Riyadh, Saudi Arabia
Chyi C. Chiang, Stanford University School of Medicine, Stanford, California, United States
Xiaoqi Li, Northwestern University Feinberg School of Medicine, Chicago, Illinois, United States
Zaibo Li, OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER, Columbus, Ohio, United States
Oscar Lin, Memorial Sloan Kettering Cancer Center, New York, New York, United States
Britt-Marie E. Ljung, University of California San Francisco, San Francisco, California, United States
Amy Ly, MASSACHUSETTS GENERAL HOSPITAL, Boston, Massachusetts, United States
Patrick McIntire, LOYOLA UNIVERSITY MEDICAL CENTER, Maywood, Illinois, United States
Swati Mehrotra, LOYOLA UNIVERSITY MEDICAL CENTER, Maywood, Illinois, United States
Pamela Michelow, National Health Laboratory Service, Johannesburg, South Africa
Santos V. Nicosia, University of South Florida, Tampa, Florida, United States
N. Paul Ohori, UPMC, Pittsburgh, Pennsylvania, United States
Vijayalakshmi Padmanabhan, Ben Taub Hospital, Houston, Texas, United States
Ajit Paintal, Northwestern University Feinberg School of Medicine, Chicago, Illinois, United States
Jordan Reynolds, CLEVELAND CLINIC FOUNDATION, Cleveland, Ohio, United States
Michael Roh, Mayo Clinic Minnesota, Rochester, Minnesota, United States
Mauro Saieg, Fleury, Biddeford Pool, Brazil
Suzanne M. Selvaggi, University of Wisconsin Hospital and Clinics, Madison, Wisconsin, United States
Paul Staats, UNIVERSITY OF MARYLAND MEDICAL CENTER, Baltimore, Maryland, United States
John Stewart, University of Texas MD Anderson Cancer Center, Houston, Texas, United States
Charles D. Sturgis, CLEVELAND CLINIC FOUNDATION, Cleveland, Ohio, United States
Pat Blakely, OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER, Columbus, Ohio, United States
Patricia G. Wasserman, Columbia University Irving Medical Center, New York, New York, United States
Bin Yang, CLEVELAND CLINIC FOUNDATION, Cleveland, Ohio, United States
Nancy A. Young, Albert Einstein Medical Center, Philadelphia, Pennsylvania, United States
Maureen F. Zakowski, Mount Sinai Health System, New York, New York, United States
Chengquan Zhao, Magee-Womens Hospital of UPMC, Pittsburgh, Pennsylvania, United States

ASC Executive Director

Elizabeth Jenkins, American Society of Cytopathology, Wilmington, Delaware, United States
GUIDE FOR AUTHORS

INTRODUCTION

JASC is the official journal of the American Society of Cytopathology, and will reflect the values and priorities of the society. In 2012 and 2013, JASC will consist of special supplemental issues with the annual scientific meeting abstracts of the American Society of Cytopathology. Beginning in 2014, JASC will publish its regular bimonthly issues with cutting-edge original research of the highest standard. The Journal will seek to provide an exceptional forum for interaction and dissemination of original research and educational information in the field of cytopathology and other allied disciplines in medicine. The cross-disciplinary focus of the journal will ensure sharing of information with all readers involved in the practice of cytopathology and its related basic sciences, epidemiology and clinical oncologic disciplines.

JASC will endeavor to have a positive impact not only on all aspects of cancer diagnosis and treatment, but also on other human disease. JASC will publish original work emphasizing novel discoveries or clinicopathologic correlations in a patient-centered environment, technological advances in basic and translational research with emphasis on the development of personalized medicine, and new or improved molecular techniques and their novel application for diagnosis or monitoring of disease. Preference will also be given to original work demonstrating the scholarship of education in cytopathology including new innovative tools for continuing education and training as well as designing and implementing new assessment and evaluation techniques. JASC will lead the discipline of cytopathology by setting professional quality standards ensuring diagnostic excellence, advocating laboratory safety and quality, and inter-professional education for pathologists, cytotechnologists and all allied health care specialties. It will duly address and highlight issues relating to population health and public policy topics.

Types of paper
Original Contributions
Original Contributions should not exceed 12 pages of text, 30 pages total, including references, tables and figures. References should be limited to 35 and the abstract to 250 words. A maximum of 8 figures will ordinarily suffice to illustrate key points. Manuscripts that exceed these limits, at the discretion of the editorial team, will be returned without review. The typical Original Contribution will be organized into Introduction, Materials and Methods, Results, Discussion, and possibly Conclusions/Concluding Remarks.

Annual Meeting Abstracts
Submissions to the American Society of Cytopathology Annual Scientific Meeting abstract book must contain the following elements: Introduction; Materials and Methods; Results; Conclusions.

Letters to the Editor
Journal of the American Society of Cytopathology encourages Letters to the Editor, which will be published at the discretion of the editor as space permits and are subject to editing and abridgment for length. Letters should be limited to approximately 500 words and 5 references maximum. Usually, only correspondence responding to items previously published in Journal of the American Society of Cytopathology are considered for publication, and we typically invite the authors of the original item to submit a Reply to the Letter to the Editor.

Announcements of conferences and similar events of interest to the readership of Journal of the American Society of Cytopathology should be sent to the Managing Editor at least 3 months before the first day of the month of desired publication.

Other Contributions
Book Reviews, Current Topics, and Editorials are published by invitation only.

Contact details for submission
Journal of the American Society of Cytopathology
Email: jasc@cytopathology.org
Web site: https://www.journals.elsevier.com/journal-of-the-american-society-of-cytopathology
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)

Further considerations
• Manuscript has been 'spell checked' and 'grammar checked'
• All references mentioned in the Reference List are cited in the text, and vice versa
• Permission has been obtained for use of copyrighted material from other sources (including the Internet)
• A competing interests statement is provided, even if the authors have no competing interests to declare
• Journal policies detailed in this guide have been reviewed
• Referee suggestions and contact details provided, based on journal requirements

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.

Editorial Policies and Practices
Manuscripts are considered for publication in the Journal of the American Society of Cytopathology provided that they have never been published and are not under simultaneous review by another journal. All manuscripts should be submitted electronically to https://www.evise.com/profile/api/navigate/JASC. Authors will be guided stepwise through article type, title, authors, abstract, keywords, classifications, and uploading of the files, which should be labeled with appropriate and descriptive file names (eg, AuthorText.docx, AuthorTable3.docx, AuthorFig1.eps). Please note that even though manuscript source files are automatically converted to a PDF file at submission for the review process, these source files are needed for further processing after acceptance. There are no page charges for publication, although authors may choose to sponsor an article for open access, upon acceptance for publication, at a charge of $3000 (see https://www.elsevier.com/about/open-science/open-access).

Submissions should conform to Elsevier's ethics policies (see https://www.elsevier.com/authors/journal-authors/policies-and-ethics), including statements regarding human and animal subjects and written permissions for borrowed material as appropriate. Additional information can be found at https://www.publishingcampus.elsevier.com/pages/63/ethics/Publishing-ethics.html. Only after a manuscript is accepted for publication should the corresponding author download and complete - including the signatures of all coauthors in section II - the Ethics and Financial Conflict form located at https://www.elsevier.com/__data/promis_misc/jasc-financial-disclosure.docx.
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.

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.

Funding body agreements and policies
Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the gold open access publication fee. Details of existing agreements are available online.

Open access
This journal offers authors a choice in publishing their research:

Subscription
- Articles are made available to subscribers as well as developing countries and patient groups through our universal access programs.
- No open access publication fee payable by authors.
- The Author is entitled to post the accepted manuscript in their institution's repository and make this public after an embargo period (known as green Open Access). The published journal article cannot be shared publicly, for example on ResearchGate or Academia.edu, to ensure the sustainability of peer-reviewed research in journal publications. The embargo period for this journal can be found below.

Gold open access
- Articles are freely available to both subscribers and the wider public with permitted reuse.
- A gold open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For gold open access articles, permitted third party (re)use is defined by the following Creative Commons user licenses:

Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)
For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

Green open access
Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our open access page for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution’s repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. Find out more.

This journal has an embargo period of 12 months.

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.
Informed consent and patient details

Studies on patients or volunteers require ethics committee approval and informed consent, which should be documented in the paper. Appropriate consents, permissions and releases must be obtained where an author wishes to include case details or other personal information or images of patients and any other individuals in an Elsevier publication. Written consents must be retained by the author but copies should not be provided to the journal. Only if specifically requested by the journal in exceptional circumstances (for example if a legal issue arises) the author must provide copies of the consents or evidence that such consents have been obtained. For more information, please review the Elsevier Policy on the Use of Images or Personal Information of Patients or other Individuals. Unless you have written permission from the patient (or, where applicable, the next of kin), the personal details of any patient included in any part of the article and in any supplementary materials (including all illustrations and videos) must be removed before submission.

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.

Submit your article

Please submit your article via https://www.evise.com/profile/api/navigate/JASC.

Every submission must include a Cover Letter that states that the manuscript, or parts of it, have not been and will not be submitted elsewhere for publication, and that all authors have read and approved the manuscript. Revised manuscripts should also be accompanied by a unique file (separate from the letter of submission) with responses to reviewers' and editors' comments. The manuscript should be a Microsoft Word (or compatible) file comprising title page, abstract (except announcements, correspondence, and book reviews), manuscript text, references, and table/figure legends. Authors should not embed figures, tables, or supplementary material into the manuscript file; these should be submitted separately.

Unless otherwise specified, the requirements of this journal are in accordance with the International Committee of Medical Journal Editors' Uniform Requirements for Manuscripts Submitted to Biomedical Journals (Ann Intern Med1988;108:258-265; http://www.icmje.org/urm_main.html). The manuscript, including references and legends, should be typed double-spaced in 12 point font for all text (except superscripts or subscripts), and with page numbers (line numbers encouraged) and 1 inch (2.5 cm) left-justified margins throughout. Each of the following sections should start on a new page: title page, abstract, main text, acknowledgments, references, and table/figure legends. The title page, in addition to the title, should include authors' names and degrees; institutional and/or corporate affiliations including postal codes; up to 5-7 keywords; a running head that condenses the full title; conflict of interest and funding disclosures; and the complete contact information of the corresponding author. Authors are expected to disclose any commercial associations that might pose a conflict of interest in connection with the submitted manuscript; all funding sources supporting the work should be routinely acknowledged.

Unless otherwise noted, the style of Journal of the American Society of Cytopathology follows AMA Manual of Style, 10th ed. (http://www.amamanualofstyle.com). Formatting, such as Greek letters, italics, super- and subscripts, may be used; such elements must be consistently formatted throughout the manuscript, including tables and legends. Gene symbols should be italicized, whereas proteins are in Roman text. We encourage authors to follow HUGO (http://www.genenames.org/) and Universal Protein Resource nomenclature (http://www.uniprot.org/). Authors should avoid abbreviations in the title and minimize their use in the abstract and main text, particularly for diseases. All abbreviations should be defined the first time they appear in the abstract and text. Standard abbreviations that follow the Unified Medical Language System (https://uts.nlm.nih.gov/home.html) are preferred. Otherwise, a list of definitions for nonstandard abbreviations should be provided on a separate page following the abstract.

All manuscripts should be in grammatically correct, colloquial American English. Manuscripts that do not meet this requirement may be returned to the authors for editing. Non-English speaking authors are encouraged to consult native English speakers or English copy editors prior to submission. In
some cases, manuscripts accepted for publication may be edited at the authors’ expense to comply with proper English usage. The Editorial Office reserves the right to revise the wording of manuscripts accepted for publication in the journal.

"Personal communications" and "unpublished observations" should be indicated within the text but excluded from the reference list. Information from manuscripts submitted but not yet accepted should be cited in the text as "unpublished observations." For manuscripts that have been accepted for publication, authors should provide as much information as is currently available, including year and DOI if published online. Updates are appreciated once more information, such as volume and page numbers, becomes available. All author/editor names should be listed when fewer than 7; otherwise, insert "et al" after third name.

**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 one independent expert reviewer 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.

**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.

**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.

**Abstract**
Abstracts for original contributions should not exceed 250 words and should be formatted into the following four (4) sections - Introduction, Materials and Methods, Results, and Conclusions.

**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.

Immediately after the abstract, provide a maximum of 6 keywords, using American 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, yyy]; 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.

Superscript lower-case letters should be used to denote additional footnotes, and asterisks or footnote letters for statistically significant data instead of values in bold.

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/halftone (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) in addition to color reproduction in print. 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.

Please use small non-bold, non-italic capital letters and place them in Arial font when using figure headings/labels. Authors who would like to test their figures for publication quality should use Digital Expert: http://dx.sheridan.com/.

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.

A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. Journal of Geophysical Research, https://doi.org/10.1029/2001JB000884. Please note the format of such citations should be in the same style as all other references in the paper.

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 management software
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley. Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:
When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.
Reference style

Text: Indicate references by (consecutive) superscript arabic numerals in the order in which they appear in the text. The numerals are to be used outside periods and commas, inside colons and semicolons. For further detail and examples you are referred to the AMA Manual of Style, A Guide for Authors and Editors, Tenth Edition, ISBN 0-978-0-19-517633-9.

List: Number the references 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:

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.

Data visualization
Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions here to find out about available data visualization options and how to include them with your article.

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**
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 find out when your accepted article will be published.

© Copyright 2018 Elsevier | https://www.elsevier.com