DESCRIPTION

Diagnostic and Interventional Imaging publishes original articles and reviews of high quality in the field.

The Journal includes five issues of CME within the twelve yearly issues.

The Journal focuses on illustrated articles with great iconographic topics.

Diagnostic and Interventional Imaging is a great aid for sharpening clinical decision-making skills as well as following high Research topics.

IMPACT FACTOR

2018: 2.486 © Clarivate Analytics Journal Citation Reports 2019

ABSTRACTING AND INDEXING

Scopus
Embase
PubMed/Medline
Hinari
Science Citation Index Expanded
Journal Citation Reports - Science Edition
Current Contents - Clinical Medicine
Biological Abstracts
Research Alert
SCImago Journal Rank (SJR)

EDITORIAL BOARD

Editor-in-chief
Philippe Soyer, Hopital Cochin Service de Radiologie, Paris, France
Senior Associate Editor
Hervé Trillaud, Centre Hospitalier Universitaire de Bordeaux, Bordeaux

Deputy Editor
Jean-Paul Beregi, Hospital Universitaire Caremeau Radiologie Imagerie Medicale, Nimes
Alain Blum, University Hospital Centre Nancy, Nancy
Emmanuel Coche, Department of Radiology Saint Luc University Clinics, Bruxelles
François Cornelis, AP-HP Hôpital Tenon, Service de Radiologie, Paris
Jean-François Deux, Hospital Henri Mondor Service Oncologie-Radiotherapie, Créteil
Boris Guiu, University Hospital Centre Dijon of Diagnostic and Interventional Radiology, Dijon
Olivier Naggara, HOPITAL SAINTE ANNE, Paris
Catherine Oppenheim, Necker hospital,Paris Descartes University,Clinique Sainte-Anne, Paris
Michel Pannu, Marseille Public University Hospital System Department of Radiology, Marseille
Maxime Bonot, Hospital Beaujon Service d’Imagerie Medicale, Clichy
Olivier Rouvière, Civil Hospices of Lyon, Urinary and vascular imaging, Lyon
Hélène Vernhet, Hospital Arnaud de Villeneuve Departement Imagerie, Montpellier

Emeritus Editor
Jean-Louis Dietemann, Hautepierre Radiology Department II, Strasbourg
Patrice Taourel, Hospital Lapeyronie, Service d’imagerie médicale, Montpellier

Section Editor
Catherine Adamsbaum, Hospital Bicetre, Le Kremlin Bicetre
Lionel Arrivé, Hospital Saint-Antoine, Paris
Christophe Aubé, Centre Hospitalier Universitaire d’Angers Department de radiologie, Angers
Thierry de Baere, Gustave Roussy Service d’Imagerie Therapeutique, Villejuif
Corinne Baileyguier, Gustave Roussy Departement d’imagerie medicale, Villejuif
Fabrice Bonneville, University Hospital Centre Toulouse neuroradiology Service, Toulouse
Mourad Boudiaf, Hospital Lariboisiere Gastro-Intestinal and Vascular Radiology Service, Paris
Loïc Boussel, Hospital de la Croix-Rousse, Lyon
Valérie Bousson, Visceral and Vascular Radiology Department of Lariboisiere Hospital, Paris
Nathalie Boutu, Centre Hospitalier Regional Universitaire de Lille Radiologie et Imagerie Medicale, Lille
Louis Boyer, University Hospital Centre Clermont Ferrand Radiology Service, Clermont-Ferrand
Ivan Bricault, University Hospital Centre Grenoble Alpes, Grenoble
Guillaume Chassagnon, Hospital Cochin, Paris
Jean-François Chateil, Department of Radiology and Antenatal Imaging Child and Woman, Bordeaux
Olivier Clément, Georges Pompidou European Hospital Imaging Center, Paris
Jean-Michel Correas, University Hospital Necker for Sick Children, Paris
Charles-André Cuenod, Hospital Européen Georges Pompidou Cancerologie, Paris
Catherine Cyteval, Hospital Lapeyronie, Service d’imagerie médicale, Montpellier
Jean-Nicolas Dacher, University Hospital Centre Rouen radiology Service, Rouen
Cédric De Bazelaire, Hôpital Saint-Louis, Service de Radiologie, Paris
Anthony Dohan, Hospital Lariboisiere Services medico-techniques, Paris
Philippe Douek, Civil Hospices of Lyon department of radiology, Lyon
Gaël Dournes, Centre Hospitalier Universitaire de Bordeaux, Bordeaux
Jean-Luc Drapé, Hospital Cochin of Department of Vascular and Vascular Radiology, Paris
Frédérique Dubrule, Hospital Claude Huriez, Radiology and Medical Imaging, Lille
Hubert Ducou Le Pointe, Armand-Trousseau Children Hospital, Pediatric Radiology Service, Paris
Michaël Elizer, Hospital Lariboisiere, Paris
Marie Faruch, Centre Hospitalier Universitaire de Toulouse, Toulouse
Jacques Femblinger, CHU-Nancy, Medical imaging, Vandoeuvre-lès-Nancy
Gilbert Ferretti, University Hospital Centre Grenoble Alpes, Grenoble
Afshin Gangi, University Hospitals Strasbourg Oncological and Visceral Interventional Imaging, Strasbourg
Pedro Gondim Teixeira, CHRU de Nancy, Nancy
Guillaume Gorincour, Pediatric and Prenatal Imaging Hospital Timone, Marseille
Nicolas Grenier, Childrens Hospital Pellegrin services of Radiology, Bordeaux
Olivier Hélénon, University Hospital Necker for Sick Children, Paris
Françoise Héran, Radiology Service of Rothschild hospital, Paris
Alexis Jacquier, Marseille Public University Hospital System Department of Radiology, Marseille
Éric de Kerviler, Hopital Saint-Louis, Service de Radiologie, Paris
Antoine Khilali, Hopitaux Universitaires Paris Nord Val de Seine, Paris
Jean-Pierre Laissy, Visceral Radiology Department Hospital Bichat Claude Bernard, Paris
François Laurent, Cardiovascular adaptation to ischemia, Pessac
Denis Le Bihan, Cognitive Neuroimaging Lab, Gif sur Yvette
Alain Luciani, Henri Mondor Hospital Medical Imaging, Créteil
Clément Marcelin, Centre Hospitalier Universitaire de Bordeaux, Bordeaux
Nadine Martin-Duverneuil, Department of Neuroradiology Hospital Pitie Salpetriere, Paris
Laurent Milot, Hospices Civils de Lyon, Lyon
Baptiste Morel, University Hospital Tours, Tours
Elie Mousseaux, Georges Pompidou European Hospital Cardiovascular Radiology, Paris
Mickael Ohana, Hospitaux universitaires de Strasbourg, Strasbourg
Jean Palussiere, Bergonié Institute Department of Diagnostic and Interventional Medical Imaging, Bordeaux
Philippe Puech, University Hospital Center of Lille department of uro radiology, Tourcoing
Martine Rémy-Jardin, Centre Hospitalier Regional Universitaire de Lille, Lille
Raphaëlle Renard-Penna, University Hospital Pitié Salpêtrière Division 8 Medical Imaging, Paris
Marie-Pierre Revel, Hospital Cochin Department of Radiology, Paris
Pascal Rousset, Centre Hospitalier Lyon-Sud Service d'Imagerie medicale et interventionnelle, Pierre-Bénite
Nicolas Sans, Hôpital Purpan, Service de Radiologie, Toulouse
Dominique Sirinelli, University of Tours Pediatric Hospital Department of Radiopediaetrics, Tours
Marc Sirol, Hôpital Ambroise Paré, Department of Radiology, Boulogne-Billancourt
Raphaëlle Souillard, Saint Anne Hospital Centre, Department of Neuroradiology, Paris
Gilles Soulat, Hôpital Européen Georges-Pompidou, Paris
Laurent Spelle, Bicetre Hospital Interventional Neuroradiology, Le Kremlin Bicêtre
Anne Tardivon, Ensemble hospitalier de l'Institut Curie Departement d'imagerie medicale, Paris
Isabelle Thomassin-Naggara, AP-HP Hôpital Tenon, Service de Radiologie, Paris
Thomas Toudrias, Childrens Hospital Pellegrin, Bordeaux
Vincent Vidal, Department of Radiology Hospital Timone, Marseille
Valérie Vilgrain, Hospital Beaujon AP-HP Department of Radiology, Clichy
Marc Zins, Groupe hospitalier Paris Saint-Joseph, Service d'imagerie médicale, Paris

International Advisory Board
Hicham Abada, University of Kentucky, Lexington
Shigeki Aoki, Juntendo Daigaku, Bunkyo-Ku
Mohammad Arabi, King Abdulaziz Medical City Department of Medical Imaging, Riyadh
Alberto Bazzocchi, Diagnostic and Interventional Radiology, Rizzoli Orthopedic Institute, Bologna
David A. Bluemke, University of Wisconsin Hospital and Clinics, Madison
Philippe Brunner, Centre Hospitalier Princess Grace, Monaco
Rami Chemali, Saint George Hospital University Medical Center Department of Surgery, Beirut
Alban Denys, Centre Hospitalier Universitaire Vaudois Service de radiodiagnostic et radiologie interventionnelle, Lausanne
Sidahmed Faraoun, Université Pierre et Marie Curie, Radiology, Algiers
Romuald Ferré, McGill University Health Centre, Montreal
Dimitrios K. Filippiadis, University General Hospital Athinon Department of Cardiology, Athens
Elliott K. Fishman, John Hopkins Hospital, Diagnostic Imaging and Body CT, Baltimore
Benoît Gallix, Royal Victoria Hospital, Montreal
Ricardo García-Mónaco, Italian Hospital of Buenos Aires, Department of Radiology, Buenos Aires
Andrea Giovagoni, Polytechnic University of Marche School of Medicine and Surgery, Ancona
Jafar Golzarian, University of Minnesota Department of Radiology, Minneapolis, MN
Ali Guermazi, Boston University Department of Radiology, Boston
Lotfi Hacein-Bey, University of California Davis School of Medicine, Sacramento
Masayuki Kanematsu, Gifu University, Gifu
Karen Kinkel, Clinique des Grangettes, Chêne Bougeries
Dow-Mu Koh, Royal Marsden Hospital Sutton, Sutton
Jongmin Lee, Kyungpook National University Hospital Department of Radiology, Daegu
Riccardo Manfredi, Universita' degli Studi di Roma Foro Italico Facolta di Scienze Motorie, Roma
Junichi Matsumoto, Saint Marianna University School of Medicine Emergency Medicine, Kawasaki
Sabine Schmidt, Centre Hospitalier Universitaire Vaudois Service de radiodiagnostic et radiologie interventionnelle, Lausanne
Gilles Soulez, Université de Montréal, Service de radiologie, Montréal
Nagara Tamaki, Kyoto Prefectural University of Medicine Department of Radiology, Kyoto
Bachir Taouli, Icahn School of Medicine at Mount Sinai Department of Diagnostic Molecular and Interventional Radiology, New York

Editorial Office
Mikaël Dion
INTRODUCTION
Diagnostic and Interventional Imaging is the official Journal of Société Française de Radiologie (SFR) and official Journal of Collège des Enseignants en Radiologie de France (CERF).

Diagnostic and Interventional Imaging accepts publications originating from any part of the world based only on their scientific merit. Diagnostic and Interventional Imaging does not have publication fees. All articles are published in English. The quality of the language is of paramount importance as it influences how the manuscript is received by Editors, reviewers and readers. For authors who are not English speakers and may not be experienced in scientific writing in English we strongly recommend the use of appropriate language services. The authors may consider any option available to them including the language services provided by Elsevier. More information can be found at http://webshop.elsevier.com/languageservices/. Please note that the use of language services is at the author's cost and does not guarantee that the manuscript will be reviewed or accepted.

The journal publishes editorials, technical notes, letters, original and review articles on abdominal, breast, cancer, cardiac, emergency, forensic medicine, head and neck, musculoskeletal, gastrointestinal, genitourinary, interventional, obstetric, pediatric, thoracic and vascular imaging, neuroradiology, nuclear medicine, as well as contrast material, computer developments, health policies and practice, and medical physics relevant to imaging.

Original articles
Original articles report results of a scientific study.

The abstract must be sufficiently clear and informative to allow understanding of the work without reading the complete article. The abstract (of no more than 250 words) should be organized into four separate paragraphs titled Rationale and Objectives, Materials (patients) and Methods, Results, and Conclusion. Three to five keywords that are suitable for indexing the manuscript should follow.

Manuscripts should contain discrete Introduction, Materials and Methods, Results, and Discussion sections and should not exceed 15 manuscript pages, or 3300 words (excluding references, tables, and figure legends).

Introduction: It should be organized into three parts: the first part defines the problem, the second part briefly reviews what is known about this problem (with references), the last paragraph states clearly the objectives, taking into account what has been summarized in the previous paragraph and, briefly, the means used to achieve them.

Material (or patients) and methods: The selection criteria for patients and controls are precisely listed. The compositions of groups, age, sex, clinical symptoms, etc. are detailed. Protocols (imaging techniques, analytic methods, specific diagnostic criteria or criteria of analysis, standard reference selected, statistical tests, etc.) must be precisely established taking into account, however, only useful data. Techniques or evaluation criteria, clinical or radiologic that have already been described elsewhere may only be referred to the publication where they have been detailed. In case of non-clinical work, full features of the animals or devices are provided for the experiment must be reproduced in full. There are no results in this chapter and the verbs are in the past tense. The favourable opinion given by an ethics committee may be mentioned where appropriate.

Results: All results related to the study are provided and exposed clearly and logically, including negative results. If tables are used, there should be no redundancy between the text and the tables. They are expressed in the past tense.

Discussion: The purpose of this chapter is to discuss the materials and methods and to examine the validity of the results. The first paragraph of the discussion must therefore expose the answers that the authors have provided to the questions they have asked and motivated the research. Authors can then put these results in relation to previous knowledge and compare them with data from the literature. Performance, limitations, false diagnoses, pitfalls and artefacts should be discussed here, as well as the lessons from this experience and proposed solutions to problems.

Conclusion: It summarizes very briefly the results of the study and their implications.

Reviews
A review details as completely as possible the state of the art on a technique or management of a pathology or particular clinical situation. It may consist in an update on related subjects (legislation, professional, etc.). The abstract is not structured; it must specify the aim of the article and summarize the main points. It should not exceed 250 words and be accompanied by three to five keywords.
**Essential image**

This form of publication is based on illustrations of excellent quality, presenting a typical image (imaging, anatomical pathology or a new technique). The title should not exceed 8 words and should state the diagnosis. There should be no more than 3 authors. The figure cannot exceed 4 panels and should be carefully prepared, ensuring that all panels are at the same magnification. The text should be short and concise, not exceeding 150 words; the references are limited to 2.

**Technical notes**

Technical notes briefly describe a technique, a technique modification or new equipment. A short discussion should give a general overview. The discussion should be limited to a specific message about the interest of the technique or technical equipment. There are no more than 2 figures and no summary. The manuscript length does not exceed 4 pages double-spaced, including references and figure legends, plus the title page. Three to five keywords should be provided.

**Letters (clinical observations)**

Letters are limited to 700 words, 4 figures and 6 references. Letters reporting original clinical cases only will be published, showing aspects of a pathology that have not or rarely been reported. The introduction should be brief, stating the interest of the case. The discussion should be short and focused on the new issues emerged. A literature review is not recommended in these clinical observations. The abstract is optional, three to five keywords should be provided. The length of the manuscript does not exceed 4 pages double-spaced, including references and figure captions, plus the title page. A maximum of 6 authors may sign the Letter.

**Radiologic pathologic correlations**

These articles emphasize a high quality radiologic pathologic correlation to better understand the radiological semiology. A macroscopic image of the pathology must be included. The text should be short, less than 800 words excluding figure legends and references. The abstract is not required, the number of figures should be limited to 4 including macroscopic images, and the number of references should not exceed 6. Three to five keywords should be provided.

Please submit manuscripts on the journal’s editorial site (https://www.editorialmanager.com/diii). If you have any queries, contact Mikael Dion, editorial assistant: mikael.dion@sfradiologie.org

**Page charges**

This journal has no page charges.

**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.

Manuscripts will be returned to the authors if any of the requested information or file as per these instructions is missing.

BEFORE YOU BEGIN

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

All authors are expected to supply, alongside their article and other files, a single completed ethics form which includes all requested declarations (see below) and can be downloaded here.

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.
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').

Author contributions
For transparency, we encourage authors to submit an author statement file outlining their individual contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should be formatted with the names of authors first and CRediT role(s) following. More details and an example

Authorship
All authors should have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

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.

Clinical trial results
In line with the position of the International Committee of Medical Journal Editors, the journal will not consider results posted in the same clinical trials registry in which primary registration resides to be prior publication if the results posted are presented in the form of a brief structured (less than 500 words) abstract or table. However, divulging results in other circumstances (e.g., investors’ meetings) is discouraged and may jeopardise consideration of the manuscript. Authors should fully disclose all posting in registries of results of the same or closely related work.

Reporting clinical trials
Randomized controlled trials should be presented according to the CONSORT guidelines. At manuscript submission, authors must provide the CONSORT checklist accompanied by a flow diagram that illustrates the progress of patients through the trial, including recruitment, enrollment, randomization, withdrawal and completion, and a detailed description of the randomization procedure. The CONSORT checklist and template flow diagram are available online.

Registration of clinical trials
Registration in a public trials registry is a condition for publication of clinical trials in this journal in accordance with International Committee of Medical Journal Editors recommendations. Trials must register at or before the onset of patient enrolment. The clinical trial registration number should be included at the end of the abstract of the article. A clinical trial is defined as any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects of health outcomes. Health-related interventions include any intervention used to modify a biomedical or health-related outcome (for example drugs, surgical procedures, devices, behavioural treatments, dietary interventions, and process-of-care changes). Health outcomes include any biomedical or health-related measures obtained in patients or
participants, including pharmacokinetic measures and adverse events. Purely observational studies (those in which the assignment of the medical intervention is not at the discretion of the investigator) will not require registration.

Article transfer service
This journal is part of our Article Transfer Service. This means that if the Editor feels your article is more suitable in one of our other participating journals, then you may be asked to consider transferring the article to one of those. If you agree, your article will be transferred automatically on your behalf with no need to reformat. Please note that your article will be reviewed again by the new journal. More information.

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.

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.

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.

Elsevier Researcher Academy
Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.
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

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
Double-blind review
This journal uses double-blind review, which means the identities of the authors are concealed from the reviewers, and vice versa. More information is available on our website. To facilitate this, please include the following separately:
Title page (with author details): This should include the title, authors' names, affiliations, acknowledgements and any Declaration of Interest statement, and a complete address for the corresponding author including an e-mail address.
Blinded manuscript (no author details): The main body of the paper (including the references, figures, tables and any acknowledgements) should not include any identifying information, such as the authors' names or affiliations.

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, 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
Please see the section on the types of papers for specific instructions.
Manuscripts should be arranged as follows: a) Title page; b) Abstract; c) Text; d) Reference List; and e) Figure captions. Any appendices should be placed after the reference list and before the figure captions. Tables and figures must be uploaded as separate files from the manuscript file. Do not import figures or tables into the text document.

Authors should retain complete copies of their manuscripts, including the figures and tables. Authors will be notified of receipt of manuscripts.

Subdivision - numbered sections
Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

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 lower-case 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.

Title should be no more than 10 words or 80 characters long including spaces.
List each affiliation separately, if an author is affiliated to multiple institutions (e.g. a research institute and a university), each affiliation must be numbered.

**Highlights**
Highlights are optional yet highly encouraged for this journal, as they 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).

**Structured abstract**
A structured abstract is required for Original Articles; by means of appropriate headings (see the Type of papers section) it should provide the context or background for the research and should state its purpose, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific effect sizes and their statistical significance, if possible), and principal conclusions. It should emphasize new and important aspects of the study or observations.

**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 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 should be avoided. Laboratory slang, clinical jargon and uncommon abbreviations are not acceptable. Such abbreviations that are unavoidable must be defined on their first appearance in the abstract and text, giving the abbreviation between parentheses. 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.

Drugs or instrumentation names
Devices cited in the text will refer to the manufacturer according to procedures to be established in accordance with the Editorial Office; the same applies for drugs whose scientific (generic) name only appears in the text.

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).

Embedded math equations
If you are submitting an article prepared with Microsoft Word containing embedded math equations then please read this (related support information).

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.

Multiple panels figures
Please provide each panel as a separate file making sure that the figure and panel number is part of the file name (e.g. Fig1a.tif, etc.). Do not add the figure number in the illustration, this will be done by the publisher.
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). 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.

Figures from copyrighted works
If figures from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the figure caption, by citing the reference(s), which will be listed in the References section of the article. This also applies to figures that were published in another language and translated to be included in the new work (please see the Copyright section).

Tables from copyrighted works
If tables from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the table title, by citing the reference(s), which will be listed in the References section of the article. This also applies to tables that were published in another language and translated to be included in the new work (please see the Copyright section).

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: in this instance, please cite the DOI.

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 and a copy of the title page of the relevant article must be submitted.

For a reference 'in press', please provide the DOI.

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 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. Example: '..... as demonstrated [3,6]. Barnaby and Jones obtained a different result ....[8].'

**As far as possible, reference numbers are placed at the end of the sentence.**

**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 book:

Reference to a chapter in an edited book:

Reference to a website:

**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. Both corresponding and co-authors may order offprints at any time via Elsevier's Webshop. Corresponding authors who have published their article 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.