TABLE OF CONTENTS

- Description p.1
- Impact Factor p.1
- Abstracting and Indexing p.1
- Editorial Board p.1
- Guide for Authors p.5

DESCRIPTION

Journal of Materials Science and Technology aims to enhance the international exchange of scientific activities in materials science and technology.

The Journal reports principally the achievements of materials science and engineering all over the world, putting the stress on the original research papers, review articles invited by editor, letters, research notes with novelty as well as brief of scientific achievement, covering a broad spectrum of materials science and technology, encompassing:

- metallic materials
- inorganic nonmetallic materials
- composite materials

Journal of Materials Science and Technology is indexed in ISI-web of science (SCI), EI Compendex, CA, SA, CSA, RJ, JST, Scopus.

IMPACT FACTOR

2018: 5.040 © Clarivate Analytics Journal Citation Reports 2019

ABSTRACTING AND INDEXING

INSPEC

EDITORIAL BOARD

Editors-in-Chief
Lawrence Murr, Dept. of Metallurgical, Materials and Biomedical Engineering, University of Texas at El Paso, USA
Rui Yang, Institute of Metal Research, Chinese Academy of Sciences (CAS), China

Executive Vice Editor-in-Chief
Zhe-Feng Zhang, Inst. of Metal Research, Shenyang National Laboratory for Materials Sciences, China
Vice Editors-in-Chief
Yafang Han, Chinese Materials Research Society, Beijing, China
Yu-feng Zheng, Department of Materials Science and Engineering, Peking University, China
Yanchun Zhou, Aerospace Research Institute of Materials & Processing Technology, China

Advisory Board Members
Linan An, Department of Philosophy, University of Central Florida, USA
Harry Bhadeshia, Department of Materials Science and Metallurgy, University of Cambridge, UK
F.R. de Boer, University of Amsterdam, Netherlands
Daolun Chen, Dept. of Mechanical and Industrial Engineering, Ryerson University, Canada
Peng Chen, School of Chemical and Biomedical Engineering, Nanyang Technological University, Singapore
Hui-Ming Cheng, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
J. Paulo Davim, Universidade do Porto, Portugal
Wenjiao Ding, School of Materials Science and Engineering, Shanghai Jiao Tong University, China
Shixue Dou, University of Wollongong, Australia
J. David Embury, McMaster University, Canada
Merton Flemings, Dept. of Mathematical Science & Engineering, Massachusetts Institute of Technology, USA
Alex Glezer, Institute for Metal Physics & Functional Materials, National University of Science and Technology MISiS, Russian Federation
Peter Greil, University of Erlangen-Nuremberg, Germany
Zheng Xiao Guo, Dept. of Chemistry, University College London (UCL), UK
Shin-ichi Hirano, Nagoya University, Japan
Boyun Huang, Central South University, China
Xin Jiang, Universität Siegen, Germany
Shigeharu Kamado, Nagaoka University of Technology, Japan
Tasadduq Khan, ONERA, France
Shuit-Tong Lee, College of Nano Science and Technology, Soochow University, China
Young Hee Lee, Department of Physics, Sungkyunkwan University (SKKU), The Republic of Korea
Yi Li, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Hua-Tay Lin, Ceramics Science and Technology Group, Oak Ridge National Laboratory, USA
Huinan Liu, Department of Bioengineering, University of California, USA
Xingbo Liu, West Virginia University, USA
Yinong Liu, University of Western Australia
Ke Li, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
N. Stewart McIntyre, University of Western Ontario, Canada
Marc André Meyers, Materials Science and Engineering Program, University of California at San Diego (UCSD), USA
Hael Mughrabi, University of Erlangen-Nuremberg, Germany
Jagdish Narayan, Dept. of Mats Science & Engineering, North Carolina State University, USA
Mitsuo Ninomi, Inst. for Materials Research, Tohoku University, Japan
Tatsuki Ohji, Advanced Manufacturing Research Inst., National Institute of Advanced Industrial Science and Technology (AIST), Japan
Fu-sheng Pan, Chongqing Academy of Science and Technology (CAST), China
Chong Rae Park, School of Materials Science and Engineering, Seoul National University (SNU), The Republic of Korea
Yutao Pei, Dept. of Physics, Rijksuniversiteit Groningen, Netherlands
Jean-marc Pelletier, Centre National de la Recherche Scientifique (CNRS), France
Reinhard Pippan, Erich Schmid Inst. Mats Sci, Austrian Acad Sci & Inst Metal, Austria
Shizhang Qiao, University of Adelaide, Australia
Hans-echkardt Scharf, Universität Stuttgart, Germany
Robert D. Shull, Magnetic Materials Group, National Institute of Standards and Technology (NIST), USA
Guangling Song, School of Materials Science and Engineering, Xiamen University, China
Ying-jun Tian, College of Materials Science and Engineering, Yanshan University, China
Guo-dong Wang, State Key Laboratory of Rolling and Automation, Northeastern University China, China
Lianzhou Wang, School of Chemical Engineering, University of Queensland, Australia
Weihua Wang, Institute of Physics, Chinese Academy of Sciences (CAS), China
Yingjun Wang, School of Materials Science and Engineering, South China University of Technology, China
Shijie Xu, Department of Physics, The University of Hong Kong, China
Jie Zhou, Department of Biomechanical Engineering, Delft University of Technology, Netherlands
Shijie Zhu, Fukuoka Institute of Technology, Japan

Editorial Board Member
Haili Bai, School of Science, Tianjin University, China
Wenzhong Bao, School of Microelectronics, Fudan University, China
Liqing Chen, State Key Laboratory of Rolling and Automation, Northeastern University China, China
Ruirun Chen, School of Materials Science and Engineering, Harbin Institute of Technology, China
Xiaobo Chen, Department of Materials Science and Engineering, Monash University, Australia
Xingxiu Chen, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Yuzeng Chen, School of Materials Science and Engineering, Northwestern Polytechnical University, China
Zhigang Chen, School of Mechanical and Mining Engineering, University of Queensland, Australia
Yuan Deng, School of Materials Science and Engineering, Beihang University, China
Juan Du, Ningbo Institute of Industrial Technology, Chinese Academy of Sciences (CAS), China
Xiaosheng Fang, Department of Materials Science, Fudan University, China
Qiang Feng, State Key Lab for Advanced Metals and Materials, University of Science and Technology Beijing, China
Qiangang Fu, School of Materials Science and Engineering, Northwestern Polytechnical University, China
Junchao Guo, School of Materials Science and Engineering, Taiyuan University of Technology, China
Minfang Han, School of Chemical and Environmental Engineering, China University of Mining and Technology, China
Yulin Hao, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Lujun Huang, School of Materials Science and Engineering, Harbin Institute of Technology, China
Mingxin Huang, The University of Hong Kong, China
Mingliang Huang, School of Materials Science and Engineering, Dalian University of Technology, China
Qizhong Huang, School of Materials Science and Engineering, Central South University, China
Weidong Huang, Sch. of Materials Science and Engineering, Northwestern Polytechnical University, China
Yong Jiang, School of Materials Science and Engineering, Beijing University of Science and Technology, China
Feiyu Kang, Dept. of Materials Science & Engineering, Tsinghua University, China
Yongpeng Lei, Central South University, China
Changjiu Li, School of Materials Science and Engineering, Xi'an Jiaotong University, China
Hejun Li, Sch. of Materials Science and Engineering, Northwestern Polytechnical University, China
Jianguo Li, School of Materials Science and Engineering, Shanghai Jiao Tong University, China
Liang Li, School of Physics and Technology, Soochow University, China
Meishuan Li, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Qian Li, School of Materials Science & Engineering, Shanghai University, China
Wenya Li, School of Materials Science and Engineering, Northwestern Polytechnical University, China
Xiaowu Li, School of Materials Science and Technology, Northeastern University China, China
Yongji Lin, School of Mechanical and Electrical Engineering, Central South University, China
Bin Liu, School of Materials Science & Engineering, Shanghai University, China
Bingbing Liu, State Key Lab. of Superhard Materials, Jilin University, China
Feng Liu, School of Materials Science and Engineering, Northwestern Polytechnical University, China
Gang Liu, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Gang Liu, School of Materials Science and Engineering, Xi'an Jiaotong University, China
Qing Liu, School of Materials Science and Engineering, Chongqing University, China
Yichun Liu, Northeast Normal University, China
Lei Lu, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Zhaoping Lu, State Key Lab for Advanced Metals and Materials, University of Science and Technology Beijing, China
Xing Ma, School of Materials Science and Engineering, Harbin Institute of Technology, China
Zongyi Ma, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Kancheng Mai, School of Chemistry and Chemical Engineering, Sun Yat-Sen University, China
Liqiang Mai, School of Materials Science and Engineering, Wuhan University of Technology, China
Xiangkang Meng, College of Engineering and Applied Sciences, Nanjing University, China
Xianglong Meng, School of Materials Science and Engineering, Harbin Institute of Technology, China
Qiuming Peng, School of Materials Science and Engineering, Yanshan University, China
G.W. Qin, Northeastern University China, China
Liangti Qu, Dept. of Vehicle Engineering, Beijing Institute of Technology, China
Xu Ran, Sch. of Materials Science and Technology, Changchun University of Science and Technology, China
Wencai Ren, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Zhiwei Shan, School of Energy and Power Engineering, Xi'an Jiaotong University, China
Tao Shen, Kunming University of Science and Technology
Huiji Shi, School of Aerospace Engineering, Tsinghua University, China
Dongming Sun, Institute of Metal Research, Chinese Academy of Sciences, China
Jun Sun, School of Materials Science and Engineering, Xi'an Jiaotong University, China
Ziqi Sun, School of Chemistry, Physics and Mechanical Engineering, Queensland University of Technology, Australia
Sufang Tang, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Peng Tong, Hefei Institute of Physical Science, Chinese Academy of Sciences (CAS), China
Shan-Tung Tu, Dept. of Mechanical Engineering, East China University of Science and Technology, China
Cong Wang, School of Metallurgy, Northeastern University China, China
Gang Wang, School of Materials Science and Engineering, Shanghai University, China
Huiyuan Wang, School of Materials Science and Engineering, Jilin University, China
Jianqiu Wang, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences (CAS), China
Luning Wang, School of Materials Science and Engineering, Beijing University of Science and Technology, China
Tongmin Wang, School of Materials Science and Engineering, Dalian University of Technology, China
Zhaodong Wang, State Key Laboratory of Rolling and Automation, Northeastern University China, China
Zumin Wang, School of Materials Science and Engineering, Tianjin University, China
Xinglong Wu, School of Physics, Nanjing University, China
Yuan Wu, State Key Lab for Advanced Metals and Materials, University of Science and Technology Beijing, China
Yunchang Xin, School of Materials Science and Engineering, Chongqing University, China
Dake Xu, School of Materials Science and Technology, Northeastern University China, China
Ke Xu, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (CAS), China
Wei Xu, State Key Laboratory of Rolling and Automation, Northeastern University China, China
Guanjun Yang, School of Materials Science and Engineering, Xi’an Jiaotong University, China
Lei Yang, Soochow University, China
Haijun Yu, School of Materials Science and Engineering, Beijing University of Technology, China
Jia Guo Yu, School of Materials Science and Engineering, Wuhan University of Technology, China
Yan Yu, Department of Material Science & Engineering, University of Science and Technology of China (USTC), China
Yanlei Yu, Department of Materials Science, Fudan University, China
Xiaojin Zeng, School of Materials Science and Engineering, Shanghai Jiaotong University, China
Xiancheng Zhang, East China University of Science and Technology, China
Zhengjun Zhang, School of Materials Science and Engineering, Tsinghua University, China
Zhiyong Zhong, School of Microelectronics and Solid-State Electronics, University of Electronic Science and Technology of China, China
Zhenchen Zhong, Jiangxi University of Science and Technology, China
Yichun Zhou, School of Materials Science and Engineering, Xiangtan University, China
Yingying Zong, School of Materials Science and Engineering, Harbin Institute of Technology, China
GUIDE FOR AUTHORS

INTRODUCTION
Submit your paper: http://mc03.manuscriptcentral.com/jmst
Before submission, please carefully read "Information for Authors", in which you can probably find some important information for your contribution.
If you are a new author submitting to JMST, please visit www.JMST.org to select register from the menu at the top and enter the requested information.
If you are already registered as an author or a reviewer, please do not register again. Select login from the menu at the top, enter your username and password and then click the appropriate log in button. If your email or other address details change, you can update your information by selecting "change details" after you log in.
All activities, such as paper submission, status track and revised paper's resubmission will be available online. Also, E-mail submission is also available if authors do not favor online submission. Contribution by hard copy mailing is not allowed.
If you have previously registered on our site but forgot your password, please enter your email address and click "Submit" Username and Password". Our system will then email your username and password to you. Below please find more details for JMST.

Editorial coverage
The Journal of Materials Science & Technology (JMST) publishes original papers covering a broad spectrum of materials science and technology, including metallic, inorganic non-metallic, organic polymer as well as composite materials.

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.
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 conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors should complete the declaration of interest statement using this template and upload to the submission system at the Attach/Upload Files step. If there are no interests to declare, please choose: 'Declarations of interest: none' in the template. This statement will be published within the article if accepted. More information.

Indexed in
ISI-web of science (SCI), EI Compendex, CA, SA, CSA, RJ, JST, Scopus

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

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

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

Contributions
Contributions from all over the world are welcome.
The Editors-in-Chief reserve the right of acceptance or rejection, or of request for amendments. Prior publication is a basis for rejection. Appearance in a conference proceeding is not necessarily prior publication.

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

Copyright
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.
Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

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

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

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

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

**Open access**
Please visit our Open Access page from the Journal Homepage for more information.

**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.

**Manuscript**
1) Papers should be written in English, and submitted online.
2) The manuscript should be typed double-spaced on one side of A4 (30×21 cm) paper, with an ample margin.
3) Mathematical expressions and Greek or other symbols should be clearly identified.
4) Clear differentiation should be made between the different headings of sections, subsections, etc.
A 1. 1.1 and (1) system is recommended for this purpose.
5) The author's name, technical title, phone number, E-mail address should be typed on the first page of the paper.
6) A short abstract of not more than 500 words should be contained in each paper.
7) Equations, tables, and figures should be numbered consecutively through the next (equations as (1). (2). (3). ... ', tables and figures as 1.2.3. ... ').
8) Acknowledgements (including fund and fund number) should be gathered together in a separate section at the end of the text.
9) The International System of Units (SI) should be used. If other units are required in special cases, a conversion to SI must be provided in parentheses or in a table.

**References**
References must be published work, and numbered consecutively in order of their first citation. References should be listed individually at the end of the text and indicated in the text with a superscript number in square brackets. All of the authors, as well as the titles of the reference articles should be given. Here are some examples of how to set the most common reference types:
PREPARATION

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

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

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

Article structure
Subdivision - 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.

**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).

**Abstract**

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

**Graphical abstract**

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

Authors can make use of Elsevier's Illustration Services to ensure the best presentation of their images and in accordance with all technical requirements.

**Keywords**

Immediately after the abstract, provide a maximum of 6 keywords, using 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, 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.

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

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

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

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

Formats
If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format. Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):
- EPS (or PDF): Vector drawings, embed all used fonts.
- TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.
- TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.
- TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

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

Figures
Figures should be original graphs (*.tif) with high contrast, suitable for immediate reproduction, typed on separate sheets and identified by its number. Width of an image should be sized to 6.5 cm for one column, 13.5 cm for full columns; and a maximum width is 15 cm for full page. In the figures, the main lines should be about 0.3 mm in width, and the assistant lines 0.15 mm. Notations in the figures should be distinct and consistent with the same ones in the text, and their font size will be 8-10 pt. Line drawings and graphs must have exported resolution of at least 1200 dpi. Photographs and micrographs must have resolution of at least 300 dpi (600 dpi if there is text or line art in the figure). Please use LZW compression. The positions of figures should be marked in the text by boxes of a suitable size. Each figure should have its own caption.

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.

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.

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.

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.

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

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

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

**AFTER ACCEPTANCE**

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

**Offprints**
The corresponding author will be notified and receive a link to the published version of the open access article on ScienceDirect. This link is in the form of an article DOI link which can be shared via email and social networks. 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.

**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.

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