DESCRIPTION

*Gene Expression Patterns* is devoted to the rapid publication of high quality studies of gene expression in development. Studies using cell culture are also suitable if clearly relevant to development, e.g., analysis of key regulatory genes or of gene sets in the maintenance or differentiation of stem cells. Key areas of interest include: *In-situ* studies such as expression patterns of important or interesting genes at all levels, including transcription and protein expression Temporal studies of large gene sets during development Transgenic studies to study cell lineage in tissue formation

AUDIENCE

All scientists working in the fields of cell biology, developmental biology, molecular genetics and differentiation.

IMPACT FACTOR

2019: 0.897 © Clarivate Analytics Journal Citation Reports 2020

ABSTRACTING AND INDEXING

Scopus
PubMed/Medline
EMBiology
Elsevier BIOBASE
Biological & Agricultural Index
Biological Abstracts
BIOSIS Previews
Current Awareness in Biological Sciences
Genetics Abstracts
BIOSIS Citation Index
Chemical Abstracts
Embase
Pascal Francis
Science Citation Index Expanded
Biochemistry and Biophysics Citation Index
EDITORIAL BOARD

Editor-in-Chief
Roberto Mayor, University College London, London, United Kingdom

Editors
Sally Horne-Badovinac, University of Chicago, Chicago, Illinois, United States of America
Christian Klaembt, University of Münster Institute of Neuro- and Behavioural Biology, Münster, Germany
Didier Stainier, Max Planck Institute for Heart and Lung Research, Bad Nauheim, Germany

Editorial Board
Shinichi Aizawa, RIKEN Center for Developmental Biology, Kobe, Japan
Miguel Allende, University of Chile Faculty of Sciences, Santiago, Chile
Paola Bovolenta, Autonomous University of Madrid Severo Ochoa Molecular Biology Centre, Madrid, Spain
Marianne Bronner, California Institute of Technology, Pasadena, California, United States of America
Miguel Concha, University of Chile Laboratory of Experimental Ontogeny, Santiago, Chile
Sally Dunwoodie, Victor Chang Cardiac Research Institute, Darlinghurst, Australia
Oliver Hober, Columbia University, New York, New York, United States of America
Philip Ingham, Nanyang Technological University, Singapore, Singapore
Naihe Jing, Shanghai Institutes for Biological Sciences Chinese Academy of Sciences, Shanghai, China
Ryoichiro Kageyama, Kyoto University, Kyoto, Japan
Robb Krumlauf, Stowers Institute for Medical Research, Kansas City, Missouri, United States of America
Kenji Matsuno, Osaka University School of Science Graduate School of Science, Toyonaka, Japan
Fumio Matsuzaki, RIKEN Center for Biosystems Dynamics Research, Yokohama, Kanagawa, Japan
Jocelyn McDonald, Kansas State University, Manhattan, Kansas, United States of America
Anming Meng, Tsinghua University, Beijing, China
Rakesh Mishra, Centre for Cellular and Molecular Biology CSIR, Hyderabad, India
Cecilia Moens, University of Washington, Seattle, Washington, United States of America
Denise Montell, University of California Santa Barbara, Santa Barbara, California, United States of America
Xavier Neto, University of Sao Paulo, São Paulo, Brazil
Christof Niehrs, Institute of Molecular Biology, Mainz, Germany
Angela Nieto, Neurosciences Institute of Alicante, San Juan de Alicante, Spain
Nancy Papalopulu, The University of Manchester, Manchester, United Kingdom
Anna Philpott, University of Cambridge, Cambridge, United Kingdom
Yumiko Saga, National Institute of Genetics, Mishima, Japan
Steffen Scholpp, University of Exeter, Living Systems Institute, Exeter, United Kingdom
Dalit Sela-Donenfeld, Hebrew University of Jerusalem Robert H Smith Faculty of Agriculture Food and Environment, Rehovot, Israel
Sergei Sokol, Icahn School of Medicine at Mount Sinai, New York, New York, United States of America
Claudio Stern, University College London, London, United Kingdom
Andrea Streit, King's College London, London, United Kingdom
Teruko Taketo, McGill University, Montreal, Quebec, Canada
Naoto Ueno, National Institute for Basic Biology, Okazaki, Japan
Stephane Zaffran, Aix-Marseille University Faculty of Medicine, Marseille, France
GUIDE FOR AUTHORS

Your Paper Your Way
We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

To find out more, please visit the Preparation section below.

Types of paper

The journal publishes only Full length Articles. Due to the nature of data described in GEP papers, we encourage authors to adopt a short report format with limited amount of text, which should avoid redundant descriptions and be as concise and clear as possible. There are no limits in number of figures.

Use the below checklist to ascertain that your manuscript conforms to the criteria required for it to be suitable for publication, and which are used in the evaluation by the editor and referees. In order to provide rapid review and publication, only one round of significant revision is allowed.

The study must report new information on one of the following:

- The spatial and temporal expression during development of a gene(s) that has potential or known importance for developmental mechanisms
- The temporal expression of large gene sets during an interesting period or process of development
- Studies of gene expression in cell culture which have clear developmental relevance
- Studies of spatial and temporal gene expression must fulfill one of the following:
  - It is an analysis of one or more genes in all embryo tissues
  - If a study in a specific developing organ, it reports expression of several genes, or of a single gene if it has high intrinsic interest
  - It reports the results of an in situ screen
  - The study must be detailed and with high quality data, such that it provides a definitive analysis of the sites and timing of gene expression.
  - Studies of many genes, such as gene families or results of in situ screens, do not require the detailed analysis that is essential for one or several genes.

For genes already analysed in another species, the study should provide significant new insight, such as differences in expression or more detailed information that may be functionally important.

There must be sound evidence for the specificity of detection of gene expression, and precise information provided on the reagents, such as antibody or in situ hybridisation probes. Any functional speculations should be brief and informative.

Studies using gene regulatory elements or gene knock-ins to drive reporter expression are suitable if they present a thorough analysis of gene regulatory regions, or report useful tools, such as lines generated in gene trap screens.

Studies of temporal expression of gene sets must be rigorous, with high quality data, and provide information important for developmental biologists.

Contact details for submission

Manuscripts for Gene Expression Patterns should be submitted via the journal's online submission system at https://www.editorialmanager.com/gep/default.aspx.

For questions on the submission and reviewing process, please contact gep@elsevier.com.

For technical questions, please visit our Support Center. Here you will be able to learn more about the online submission and editorial system via interactive tutorials, explore a range of problem solutions via our knowledgebase, and find answers to frequently asked questions. You will also find our 24/7 support contact details should you need any assistance from one of our customer service representatives.
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 on Ethics in publishing.

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 anonymized) or the manuscript file (if single anonymized). If there are no interests to declare then please state this:
'Declarations of interest: none'. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. More information.

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

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

**Use of inclusive language**
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

**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

**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.

**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.

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

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

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

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

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

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.

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.

When invited to do so by the handling editor after the review process, authors are normally expected to submit a revised version within about 6 months.

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.
Suggested referees must not be from your own institution and must not have collaborated with you at least during the last five years, and should not already have provided you with comments on the manuscript. You should indicate the expertise of the referee in relation to the topic of your manuscript. You may also suggest up to two referees to exclude due to conflicts of interest.

**Additional information**

One of the terms and conditions of publishing in Mechanisms of Development is that authors be willing to distribute any materials and protocols used in the published experiments to qualified researchers for their own use. Materials include but are not limited to cells, DNA, antibodies, reagents, organisms, and mouse strains, or if necessary the relevant ES cells. These must be made available with minimal restrictions and in a timely manner. If there are restrictions to the availability of any materials, data, or information, these must be disclosed in the cover letter of the manuscript at the time of submission.

**Key resources table**

We encourage authors to submit a key resources table during submission. The Key Resources Table serves to highlight materials and resources (including genetically modified organisms and strains, cell lines, reagents, software, experimental models, and original source data for computational studies) essential to reproduce results presented in the manuscript. Literature listed in the Key Resources Table must be included in the References list. We highly recommend using RRIDs (see https://scicrunch.org/resources) as the identifier for antibodies and model organisms in the Key Resources Table. Please do not add custom headings or subheadings to the Key Resources Table. Please download and fill out this template. The Key Resources Table should be referenced at the end of the Materials & Methods section and uploaded as a separate file in the submission process.

**Data from microarray and other similar screens**

Please see the MGED open letter specifying microarray standards at http://www.mged.org/Workgroups/MIAME/miame_checklist.html. Authors submitting manuscripts relying on microarray or similar screens must supply the data as Supplementary data (see below) at the time of submission, along with the completed MIAME checklist. The data must be MIAME-compliant and supplied in a form that is widely accessible. The microarray data must also be submitted to either the GEO (http://www.ncbi.nlm.nih.gov/geo/) or ArrayExpress (http://www.ebi.ac.uk/arrayexpress/) databases, with accession numbers at or before acceptance of the paper for publication. The Editors understand that on occasion authors may not feel it appropriate to deposit the entire data set at the time of publication of this paper. We are therefore willing to consider exceptions to this requirement in response to a request from the authors, which must be made at the time of initial submission or as part of an informal pre-submission enquiry.

**Mouse gene expression data**

Upon acceptance of the manuscript for publication, authors reporting mouse gene expression data from RNA in situ hybridization, immunohistochemistry, Northern blot, Western blot and RT-PCR experiments are requested to submit the pertinent data to the Mouse Gene Expression Database (GXD). These submissions will receive accession numbers that must then be inserted into the manuscript. Please see GXD’s guidelines for electronic data submission at http://www.informatics.jax.org/mgihome//GXD/GEN/gxd_submission_guidelines.shtml.

**Gene and protein nomenclature**

The journal supports the use of the official nomenclature for genes and proteins and discourages the use of outdated and incorrectly formatted names and symbols. To this end, we encourage authors before submission to confirm the current official name and/or symbol for all genes and proteins mentioned in their articles following the guidelines listed in the following online resources:

**Arabidopsis:** The Arabidopsis Information Resource (TAIR) - nomenclature guidelines

**Chicken:** Chicken Gene Nomenclature Consortium (CGNC)

**Drosophila:** FlyBase -nomenclature guidelines
**Human:** Human Gene Nomenclature Committee (HUGO)

**Mouse:** Mouse Genome Informatics (MGI) - Mouse nomenclature guidelines

**Nematodes:** WormBase - nomenclature guidelines

**Rat:** Rat Genome Database (RGD) - Rat nomenclature guidelines

**Xenopus:** Xenbase - Xenopus nomenclature guidelines

**Yeast:** Saccharomyces Genome Database (SGD) - nomenclature guidelines

**Zebrafish:** ZFIN - Zebrafish nomenclature guidelines

**PREPARATION**

**NEW SUBMISSIONS**
Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts your files to a single PDF file, which is used in the peer-review process.

As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or layout that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately.

**References**
There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

**Formatting requirements**
There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions.
If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.
Divide the article into clearly defined sections.

**Figures and tables embedded in text**
Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

**Peer review**
This journal operates a single anonymized 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. Editors are not involved in decisions about papers which they have written themselves or have been written by family members or colleagues or which relate to products or services in which the editor has an interest. Any such submission is subject to all of the journal’s usual procedures, with peer review handled independently of the relevant editor and their research groups. More information on types of peer review.

**REVISED SUBMISSIONS**
However, be aware that neither of these is infallible and you are therefore strongly encouraged to seek the opinion of a native English-speaking, scientifically trained colleague.

Please use 1.5 line spacing and either Arial or Times Roman font, at least 11 point size.
Use of word processing software
Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). 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. Normally the Introduction should be Section 1., followed by Results (Section 2), then Discussion (Section 3) and Experimental Procedures (Section 4). Acknowledgements and References should follow but not be numbered. 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", "above", etc.. 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 but concise background. Explain why the study was undertaken and how it is timely and/or novel.

Results
The Results section should be written objectively, free from interpretation. It should be clear and concise.

Discussion
This should explore the significance of the results of the work, not repeat the Results section. It is generally appropriate to use this section to relate the results to other published work and to explain how they differ, or their novelty, as well as how they advance the field. However, it should also be concise and avoid extensive reference to other work in the authors' laboratory unless directly relevant to this study. It may be useful to end the Discussion with a very brief Conclusions sub-section of a single paragraph.

Experimental Procedures
Provide sufficient detail to allow the experiments and results to be reproduced. Methods already published should be indicated by references to publications where the details may be found: only relevant departures from published methods should be described.

Theory / calculations / statistical analysis
Where appropriate, a theoretical, mathematical or statistical analysis section may be included. This should not repeat any material within the rest of the article. If the analysis of the results includes complex statistical or other mathematical analysis, this should be detailed in this section, which may be a sub-section of the Experimental Procedures or follow it (as Section 5).

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
These should be avoided unless absolutely essential. If there is a theoretical or mathematical section and this needs to be substantial then it may be better to include it as an Appendix which may be included in the printed paper or as on-line Supplementary or Supporting Material, at the Handling Editor's discretion. 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 forth.

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

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

**Abstract**

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

**Graphical abstract**

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

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

**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.

**Nomenclature and units**

Follow internationally accepted rules and conventions: use the international system of units (SI). If other quantities are mentioned, give their equivalent in SI. You are urged to consult [IUPAC: Nomenclature of Organic Chemistry](https://pubs.acs.org/doi/10.1021/acs.chemrev.9b00223) for further information.

The nomenclature should be the same as that adopted by the major cell/developmental biology journals (e.g., *Cell, Developmental Cell, The EMBO Journal*).

**Footnotes**

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article.

**Artwork**

**Electronic artwork**

**General points**

- Make sure you use uniform lettering and sizing of your original artwork.
- Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Indicate per figure if it is a single, 1.5 or 2-column fitting image.
- For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.
- Please note that individual figure files larger than 10 MB must be provided in separate source files.

A detailed [guide on electronic artwork](https://www.sciencedirect.com/science/article/pii/S0379677X16300836) is available. **You are urged to visit this site; some excerpts from the detailed information are given here.**

**Formats**

Regardless of the application used, 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 the font or save the text as 'graphics'.
- TIFF (or JPEG): Color or grayscale photographs (halftones): always use a minimum of 300 dpi.
- TIFF (or JPEG): Bitmapped line drawings: use a minimum of 1000 dpi.
- TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale): a minimum of 500 dpi is required.

**Please do not:**

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); the resolution is too low.
- Supply files that are too low in resolution.
- Submit graphics that are disproportionately large for the content.

**Color artwork**

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF) or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) in addition to color reproduction in print. [Further information on the preparation of electronic artwork](https://www.sciencedirect.com/science/article/pii/S0379677X16300836).

The figures should ideally be 1000 dpi (min. 300dpi). The figures may be in either RGB or CMYK format. If supplying in RGB format, please check the typeset proof carefully to ensure the color is an accurate representation of the original figure. The figures should be the correct size so that no reduction or enlargement has to be carried out. If this is not possible it is better if the figures are sent 'too large' so that details will not be lost in the reduction process.

**Figure captions**

Ensure that each illustration has a caption. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.
Tables
Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References

Citations 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 allowed in the reference list, and strongly discouraged in the text. If such references are absolutely essential in the text, evidence must be provided at the time of submission (by an explicit statement in the covering letter or "manuscript details" during submission) that the source of the "personal communication" agrees to these data being mentioned by the authors in this paper. Citation of a reference as "in press" implies that the item has been accepted for publication.

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

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

Web References
References to personal or institutional web sites are not allowed. Any references to Web sites must be restricted to on-line resources (such as NLM, GXD, Zfin, EBI, Ensembl, Genbank, etc.) that are likely to be permanent. The full URL should be given. Web references should not be included in the reference list but must be embedded in the text.

Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

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

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

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link: http://open.mendeley.com/use-citation-style/gene-expression-patterns
When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.
Reference formatting

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct. If you do wish to format the references yourself they should be arranged according to the following examples:

Reference style

Text: All citations in the text should refer to:
1. Single author: the author's name (without initials, unless there is ambiguity) and the year of publication;
2. Two authors: both authors' names and the year of publication;
3. Three or more authors: first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references can be listed either first alphabetically, then chronologically, or vice versa.

Examples: 'as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999).... Or, as demonstrated (Jones, 1999; Allan, 2000).... Kramer et al. (2010) have recently shown ...'

List: References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

Examples:
Reference to a journal publication:

Reference to a journal publication with an article number:

Reference to a book:

Reference to a chapter in an edited book:

Reference to a website:

Reference to a dataset:

Reference to software:

Journal abbreviations source

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

Supplementary Material

GEP accepts electronic supplementary material to support and enhance your published paper. Supplementary files offer the author additional possibilities to publish supporting applications, movies, animation sequences, high-resolution images, background datasets, sound clips and more. Supplementary files supplied will be published online alongside the electronic version of your article in Elsevier Web products, including ScienceDirect: http://www.sciencedirect.com/. In order to ensure that your submitted material is directly usable, please ensure that data are provided in one of our recommended file formats. Authors should submit the material in electronic format together with the article and supply a concise and descriptive caption for each file. Video files: please supply a 'still' with each of your files: you can choose any frame from the video or make a
separate image. These will be used instead of standard icons and will personalize the link to your supplementary information. For more detailed instructions please visit our artwork instruction pages at https://www.elsevier.com/artworkinstructions.

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 in Brief
You have the option of converting any or all parts of your supplementary or additional raw data into a data article published in Data in Brief. A data article is a new kind of article that ensures that your data are actively reviewed, curated, formatted, indexed, given a DOI and made publicly available to all upon publication (watch this video describing the benefits of publishing your data in Data in Brief). You are encouraged to submit your data article for Data in Brief as an additional item directly alongside the revised version of your manuscript. If your research article is accepted, your data article will automatically be transferred over to Data in Brief where it will be editorially reviewed, published open access and linked to your research article on ScienceDirect. Please note an open access fee is payable for publication in Data in Brief. Full details can be found on the Data in Brief website. Please use this template to write your Data in Brief data article.

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

AFTER ACCEPTANCE
Online proof correction

To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

Offprints

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

Additional information
Gene and protein nomenclature

The journal supports the use of the official nomenclature for genes and proteins and discourages the use of outdated and incorrectly formatted names and symbols. To this end, we encourage authors before submission to confirm the current official name and/or symbol for all genes and proteins mentioned in their articles following the guidelines listed in the following online resources:

Arabidopsis: The Arabidopsis Information Resource (TAIR) - nomenclature guidelines
Chicken: Chicken Gene Nomenclature Consortium (CGNC) - nomenclature guidelines
Drosophila: FlyBase - nomenclature guidelines
Human: Human Gene Nomenclature Committee (HUGO)
Mouse: Mouse Genome Informatics (MGI) - nomenclature guidelines
Nematodes: WormBase - nomenclature guidelines
Rat: Rat Genome Database (RGD) - nomenclature guidelines
Xenopus: Xenbase - Xenopus nomenclature guidelines
Yeast: Saccharomyces Genome Database (SGD) - nomenclature guidelines
Zebrafish: ZFIN - Zebrafish nomenclature guidelines

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