MOLECULAR GENETICS AND METABOLISM
Official journal of the Society for Inherited Metabolic Disorders

TABLE OF CONTENTS

• Description p.1
• Audience p.2
• Impact Factor p.2
• Abstracting and Indexing p.2
• Editorial Board p.2
• Guide for Authors p.4

DESCRIPTION

Molecular Genetics and Metabolism is a contribution to the understanding of the metabolic basis of disease. The journal publishes articles describing investigations that use the tools of biochemistry and molecular biology for studies of normal and diseased states. In addition to original research articles, occasional minireviews reporting timely advances as well as brief communications and letters to the editor are considered.

Research Areas include:

• Inherited Metabolic Diseases:
  - Biochemical studies of primary enzyme defects
  - Molecular genetic analyses of mutations
  - Pathogenesis of these disorders, including not only primary but also secondary metabolic alterations

• Systems Biology:
  - Functional integration of biochemical network modules
  - Moonlighting functions of proteins

• Intercellular and Intracellular Metabolic Relationships:
  - Biochemical interactions between cells
  - Functional roles of and interactions between subcellular compartments and distinct regions within these cellular spaces, termed microcompartments
  - Metabolic relations between individual enzymes and pathways

• Cellular Catalysts:
  - Protein and nonprotein catalyst in normal and deranged cellular metabolism
  - Relationships between the structure and function of catalytic molecules
  - Interaction of these catalysts with other cellular components

• Disease Pathogenesis:
  - Underlying mechanisms of inherited and acquired diseases
  - Relationships between genotype and phenotype at the biochemical and molecular levels

• Treatment:
  - Drug, protein and dietary interventions
  - Transplantation and gene therapy
  - Multicenter clinical trials

Advances in nanomedicine, nanopediatrics and nanotechnology are also welcome.
AUDIENCE

Molecular geneticists, biochemical geneticists, endocrinologists, metabolists, biochemists, molecular biologists

IMPACT FACTOR

2016: 3.769 © Thomson Reuters Journal Citation Reports 2017

ABSTRACTING AND INDEXING

EMBASE
Scopus
EMBiology

EDITORIAL BOARD

Editor-in-Chief:
Edward RB McCabe, Distinguished Professor Emeritus, Department of Pediatrics, and Inaugural Mattel Executive Endowed Chair of Pediatrics, UCLA School of Medicine, Inaugural Physician-in-Chief, Mattel Children’s Hospital UCLA

Managing Editor:
Linda McCabe, Adjunct Professor Emerita of Human Genetics, UCLA

Editorial Board:
Rivka Beitner, Bar-Ilan University, Ramat Gan, Israel
Mike Bennett, Children's Hospital of Philadelphia, Philadelphia, Pennsylvania, USA
Nenad Blau, Universitätsspital Zürich, Zürich, Switzerland
Robert Desnick, Mount Sinai School of Medicine, New York, New York, USA
Orly Elpeleg, Hebrew University Hadassah Medical School, Jerusalem, Israel
Fumio Endo, Kumamoto University, Kumamoto, Japan
Rivka Beitner, Bar-llan University, Ramat Gan, Israel
Mike Bennett, Children's Hospital of Philadelphia, Philadelphia, Pennsylvania, USA
Nenad Blau, Universitätsspital Zürich, Zürich, Switzerland
Robert Desnick, Mount Sinai School of Medicine, New York, New York, USA
Orly Elpeleg, Hebrew University Hadassah Medical School, Jerusalem, Israel
Fumio Endo, Kumamoto University, Kumamoto, Japan
Yoshikatsu Eto, Tokyo Jikei University of Medicine, Tokyo, Japan
William Gahl, National Human Genome Research Institute (NHGRI), Bethesda, Maryland, USA
Stephen Goodman, University of Colorado Health Sciences Center, Denver, Colorado, USA
Gregory Grabowski, Children’s Hospital Medical Center, Cincinnati, Ohio, USA
John Hopwood, Adelaide Children's Hospital, North Adelaide, South Australia, Australia
Jeff Innis, University of Michigan Medical School, Ann Arbor, Michigan, USA
Priya Kishnani
Brendan Lee, Baylor College of Medicine, Houston, Texas, USA
Yoichi Matsubara, National Center for Child Health and Development (Japan), Tokyo, Japan
Roderick McInnes, Jewish General Hospital (JGH), Montréal, Quebec, Canada
Patricia McLean, University College London (UCL), London, UK
Walter Miller, University of California at San Francisco (UCSF), San Francisco, California, USA
Maximilian Muenke, National Human Genome Research Institute (NHGRI), Bethesda, Maryland, USA
Arnold Munnich, Hôpital Necker - Enfants Malades, Paris, France
Torayuki Okuyama, National Center for Child Health and Development (Japan), Tokyo, Japan
Ferdinando Palmieri, Università degli Studi di Bari Aldo Moro, Bari, Italy
Piero Rinaldo, Mayo Clinic, Rochester, Minnesota, USA
William Rizzo, University of Nebraska Medical Center (UNMC), Omaha, Nebraska, USA
Charles Roe, Baylor College of Medicine, Dallas, Texas, USA
Rima Rozen, McGill University, Montreal, Quebec, Canada
Charles Scrivener, McGill University, Montréal, Canada
Ellen Sidransky, National Human Genome Research Institute (NHGRI), Bethesda, Maryland, USA
Flemming Skovby, Rigshospitalet, Copenhagen, Denmark
Brage Storstein Andersen, University of Southern Denmark, Odense, Denmark
Mendel Tuchman, Childrens National Medical Center, Washington, District of Columbia, USA
Jerry Vockley, University of Pittsburgh, Pittsburgh, Pennsylvania, USA
Ronald JA Wanders, Universiteit van Amsterdam, Academisch Medisch Centrum (AMC), Amsterdam Zuidoost, Netherlands
Barry Wolf, Henry Ford Hospital, Detroit, Michigan, USA
Philip Wood, Sanford Burnham Prebys, La Jolla, California, USA
Founding Editor:
S.P. Bessman
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.

INTRODUCTION
Molecular Genetics and Metabolism is a contribution to the understanding of the metabolic basis of disease. The journal publishes articles describing investigations that use the tools of biochemistry and molecular biology for studies of normal and diseased states.

Research Areas include:

- Inherited Metabolic Diseases
  - Biochemical studies of primary enzyme defects
  - Molecular genetic analyses of mutations
  - Pathogenesis of these disorders, including not only primary but also secondary metabolic alterations
- Systems Biology
  - Functional integration of biochemical network modules
  - Moonlighting functions of proteins
- Intercellular and Intracellular Metabolic Relationships
  - Biochemical interactions between cells
  - Functional roles of and interactions between subcellular compartments and distinct regions within these cellular spaces, termed microcompartments
  - Metabolic relations between individual enzymes and pathways
- Cellular Catalysts
  - Protein and nonprotein catalyst in normal and deranged cellular metabolism
  - Relationships between the structure and function of catalytic molecules
  - Interaction of these catalysts with other cellular components
- Disease Pathogenesis
  - Underlying mechanisms of inherited and acquired diseases
  - Relationships between genotype and phenotype at the biochemical and molecular levels
- Treatment
  - Drug, protein and dietary interventions
  - Transplantation and gene therapy
  - Multicenter clinical trials
  - Pharmacogenetics / Pharmacogenomics

Submitted manuscripts claiming to be a demonstration of a new mutation will be rejected and returned to authors without review unless the authors present results of a search for the new mutation in at least 100 chromosomes from unaffected individuals of the same ethnic background as the patient(s) with the new mutation.

Authors should perform a power calculation to determine how many subjects they need to study in order to find a significant association between a sequence variation and a disorder. The results of the power calculation should be included in the methods section of the manuscript. Submitted manuscripts without a power calculation will be rejected and returned to authors without review.

Authors attempting to demonstrate genotype/phenotype correlation should review the literature below to help them interpret their results:


**Types of paper**

In addition to original research articles, occasional minireviews reporting timely advances as well as brief communications and letters to the editor are considered.

**Original articles** will be considered on the basis of the originality and quality of the work, the clarity of the presentation, and the relevance of the research to the goal of the journal. At the discretion of the Editor, an original article may be accompanied by a Commentary by a member of the Editorial Board or another contributor.

**Minireviews** will describe timely advances within the scope of the journal, emphasizing emerging topical areas and/or critically analyzing existing data. Contributors should communicate with the Editor before preparing or submitting a review in order to determine if the topic and intent are considered appropriate. At the discretion of the Editor, reviews may be accompanied by comment from one of the Editors or another contributor. Minireviews may be any length and may include any number of references. Figures and tables may be included.

**Brief Communications** will be considered for publication with an expedited review. These short manuscripts should be no more than 5 manuscript pages (approximately 1000 words) in length with a limit of one figure or table. Standard section headings should be utilized and the abstract should be limited to a few sentences (75 words or less).

**Letters to the Editor** will be considered for rapid publication if they lie within the purview of the journal and if they contain new information, comment on published work, or new theoretical suggestions. These should be brief (300 words or less) and without subject headings. One table or figure will be allowed.

**Contact details for submission**

Please submit your articles via the journal's online submission and editorial system: http://ees.elsevier.com/mgm/

**Customer support is available 24/7:**

Please use our help site at: http://epsupport.elsevier.com/. Here you will be able to learn more about online submission system via interactive tutorials, explore a range of common 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.

**Questions on submission and reviewing process:**

Please contact the Editorial Office at MolGenMetab@elsevier.com.

**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](https://www.elsevier.com/locate/ymgme).

**BEFORE YOU BEGIN**

**Ethics in publishing**
Please see our information pages on [Ethics in publishing](https://www.elsevier.com/locate/ymgme) and [Ethical guidelines for journal publication](https://www.elsevier.com/locate/ymgme).

**Human and animal rights**
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)](https://www.elsevier.com/locate/ymgme) for experiments involving humans; [Uniform Requirements for manuscripts submitted to Biomedical journals](https://www.elsevier.com/locate/ymgme). 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](https://www.elsevier.com/locate/ymgme) 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](https://www.elsevier.com/locate/ymgme), 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.

**Conflict of interest**

*Molecular Genetics and Metabolism* follows the ICMJE recommendations regarding conflict of interest disclosures. All authors are required to report the following information with each submission: (1) All third-party financial support for the work in the submitted manuscript. (2) All financial relationships with any entities that could be viewed as relevant to the general area of the submitted manuscript. (3) All sources of revenue with relevance to the submitted work who made payments to you, or to your institution on your behalf, in the 36 months prior to submission. (4) Any other interactions with the sponsor of outside of the submitted work should also be reported. (5) Any relevant patents or copyrights (planned, pending, or issued). (6) Any other relationships or affiliations that may be perceived by readers to have influenced, or give the appearance of potentially influencing, what you wrote in the submitted work. As a general guideline, it is usually better to disclose a relationship than not. This information will be acknowledged at publication in a Transparency Document link directly in the article. Additional information on the ICMJE recommendations can be found at: [http://www.icmje.org/](http://www.icmje.org/). The form for conflict of interest disclosure can be downloaded here: [http://www.icmje.org/coi_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (if this link does not display properly in your browser, please right-click the link and select "Save Target As..." or "Save Link as..." from the pop-up menu).
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 or as part of a published lecture or academic thesis or as an electronic preprint, see ‘Multiple, redundant or concurrent publication’ section of our ethics policy 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 CrossCheck.

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 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 open access articles is determined by the author's choice of user license.

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

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

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

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

Open access
This journal offers authors a choice in publishing their research:
**Open access**
- Articles are freely available to both subscribers and the wider public with permitted reuse.
- An open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

**Subscription**
- Articles are made available to subscribers as well as developing countries and patient groups through our universal access programs.
- No open access publication fee payable by authors.

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

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

**Creative Commons Attribution (CC BY)**
Let others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

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

The open access publication fee for this journal is **USD 2600**, excluding taxes. Learn more about Elsevier's pricing policy: [https://www.elsevier.com/openaccesspricing](https://www.elsevier.com/openaccesspricing).

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

This journal has an embargo period of 12 months.

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

**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.

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

**PREPARATION**
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 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 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.

REVISED SUBMISSIONS
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. 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 detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described.
Results
Results should be clear and concise.

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

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

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. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lowercase superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**
- **Present/Permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract
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.

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 xxx, 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**

Whenever enzymes are the subject of reporting, the Enzyme Commission (EC) number should be used for accurate identification and retrieval purposes. The Internet address for the Enzyme Commission is [http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html).

**Genbank**

**DNA sequences and GenBank accession numbers.** Whenever nucleic acid and/or protein sequence information is presented, an accession number from EMBL/GenBank or NBRF should be submitted. Authors wishing to enable other scientists to use the accession numbers cited in their papers via links to these sources, should type this information in the following manner: For each and every accession number cited in an article, authors should type the accession number in bold, underlined text. Letters in the accession number should always be capitalized (see example below). This combination of letters and format will enable the typesetter to recognize the relevant texts as accession numbers and add the required link to the GenBank sequences.

Example: GenBank accession nos. [AI631510](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html), [AI631511](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html), [AI632198](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html), and [BF223228](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html), a B-cell tumor from a chronic lymphatic leukemia (GenBank accession no. [BE675048](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html)), and a T-cell lymphoma (GenBank accession no. [AA361117](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html)).

Authors are encouraged to check accession numbers used very carefully. An error in a letter or number can result in a dead link. In the final version of the printed article, the accession number text will not appear bold or underlined. In the final version of the electronic copy, the accession number text will be linked to the appropriate source in the NCBI databases, enabling readers to go directly to that source from the article.

**Human gene mutations** should be named in accord with the recommendations of the Nomenclature Working Group (Antonarakis et al., Hum. Mutat. 11 (1998) 1-3; den Dunnen and Antonarakis, Hum. Mutat. 15 (2000) 7-12).

**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 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](http://www.bis.med.jhmi.edu/bio/search/FILT/enzyme.html) 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) 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.

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
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.

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 and Zotero, as well as EndNote. Using the word processor 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.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:

When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

Reference 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 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: Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.
Example: '..... as demonstrated [3,6]. Barnaby and Jones [8] obtained a different result ....'

List: Number the references (numbers in square brackets) in the list in the order in which they appear in the text.
Examples:
Reference to a journal publication:
Reference to a book:
Reference to a chapter in an edited book:
Reference to a website:
Reference to a dataset:

Journal abbreviations source

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

Video

Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly usable, please provide the files in one of our recommended file formats with a preferred maximum size of 150 MB in total. Any single file should not exceed 50 MB. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages.
Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

**Supplementary material**

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

**RESEARCH DATA**

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

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

**Data linking**

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

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

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

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

**Mendeley Data**

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

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

**Data in Brief**

You have the option of converting any or all parts of your supplementary or additional raw data into one or multiple data articles, a new kind of article that houses and describes your data. Data articles ensure that your data is actively reviewed, curated, formatted, indexed, given a DOI and publicly available to all upon publication. You are encouraged to submit your 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 and published in the open access data journal, Data in Brief. Please note an open access fee of 250 USD is payable for publication in Data in Brief. This fee applies to articles submitted before 31 December 2017. Full details can be found on the Data in Brief website. Please use this template to write your Data in Brief.
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.

ARTICLE ENRICHMENTS
AudioSlides
The journal encourages authors to create an AudioSlides presentation with their published article. AudioSlides are brief, webinar-style presentations that are shown next to the online article on ScienceDirect. This gives authors the opportunity to summarize their research in their own words and to help readers understand what the paper is about. More information and examples are available. Authors of this journal will automatically receive an invitation e-mail to create an AudioSlides presentation after acceptance of their paper.

Antibody data
Antibody Data is the reference application linking to information about the antibodies mentioned in the article, based on the NIF Antibody Registry. Authors are encouraged to include relevant antibody identifiers in their articles (e.g. Antibody Registry: AB_878537 or RRID: AB_878537) if appropriate. More information.

Interactive plots
This journal enables you to show an Interactive Plot with your article by simply submitting a data file. Full instructions.

Additional information
Authors can suggest figures to the Editor for use as the cover figure for an issue. Cover figures should be in color and include data or a schematic model. There will be no charge to the authors for printing the color figure on the journal cover.

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

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

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