DESCRIPTION

Human Immunology publishes full-length, original, hypothesis-driven basic and clinical research articles as well as brief communications, reviews and editorials covering immunogenetics, transplantation immunology, autoimmunity, and immunity to infectious diseases in humans. It also publishes short population reports, which are tied to the allelefrequencies.net database, describing allele frequencies of HLA and KIR.

The journal’s scope includes understanding the genetic and functional mechanisms that distinguish human individuals in their immune responses to allografts, pregnancy, infections or vaccines as well as the immune responses that lead to autoimmunity, allergy or drug hypersensitivity. It also includes examining the distribution of the genes controlling these responses in populations.

Research areas include:

Studies of the genetics, genomics, polymorphism, evolution, and population distribution of immune-related genes

Studies of the expression, structure and function of the products of immune-related genes

Immunogenetics of susceptibility to infectious and autoimmune disease, and allergy

The role of the immune-related genes in hematopoietic stem cell, solid organ, and vascularized composite allograft transplant

Histocompatibility studies including alloantibodies, epitope definition, and T cell alloreactivity

Studies of immunologic tolerance and pregnancy

T cell, B cell, NK and regulatory cell functions, particularly related to subjects within the journal's scope

Pharmacogenomics and vaccine development in the context of immune-related genes

Human Immunology considers immune-related genes to include those encoding classical and non-classical HLA, KIR, MIC, minor histocompatibility antigens (mHAg), immunoglobulins, TCR, BCR, proteins involved in antigen processing and presentation, complement, Fc receptors, chemokines and cytokines. Other immune-related genes may be considered.
**Human Immunology** is also interested in bioinformatics of immune-related genes and organizational topics impacting laboratory processes, organ allocation, clinical strategies, and registries related to autoimmunity and transplantation.

Original papers with new data will be given preference over uninvited reviews and meta-analyses.

As the flagship scientific publication of the American Society for Histocompatibility and Immunogenetics (ASHI), *Human Immunology* is primarily directed to readers with an interest in histocompatibility, immunogenetics, transplantation, anthropology/population studies, HLA disease association and pharmacogenomics. These include basic and clinical scientists as well as histocompatibility laboratory professionals.

**AUDIENCE**

Immunologists, Geneticists, Pathologists, Biochemists, Histocompatibility Technologists.

**IMPACT FACTOR**

2017: 1.994 © Clarivate Analytics Journal Citation Reports 2018

**ABSTRACTING AND INDEXING**

SIIC Data Bases
BIOSIS
Chemical Abstracts
Current Contents/Life Sciences
EMBASE
MEDLINE®,
Elsevier BIOBASE
Scopus

**EDITORIAL BOARD**

*Editor-in-Chief*
Amy Hahn, Albany Medical College, 47 New Scotland Avenue, Albany, New York 12208, USA

*Section Editors*
Derek Middleton, Liverpool, England, UK
Nicole. M Valenzuela, Los Angeles, California, USA
Eric Weimer, Chapel Hill, North Carolina, USA

*Associated Editors:*
Frans Claas, Leiden, Netherlands
Adriana Colovai, Bronx, New York, USA
Marcelo Fernandez-Viña, Stanford, California, USA
Pierre-Antoine Gourraud, Nantes, France
Steven Mack, Oakland, California, USA
Diogo Meyer, São Paulo, Brazil
Rajalingam Raja, San Francisco, California, USA
James Traherne, Cambridge, UK

*Editorial Board*
Lee Ann Baxter-Lowe, Los Angeles, California, USA
Edgardo Carosella, Paris Cédex 10, France
Erick. C. Castelli, Botucatu, Brazil
Dominique Charron, Paris, France
José Artur Bogo Chies, Porto Alegre RS, Brazil
Marco Colonna, St Louis, Missouri, USA
René J. Duquesnoy, Pittsburgh, Pennsylvania, USA
Soldano Ferrone, Buffalo, New York, USA
Manish Gandhi
Howard Gebel, Atlanta, Georgia, USA
William Hildebrand, Oklahoma City, Oklahoma, USA
Annette Jackson, Baltimore, Maryland, USA
Ronald Kerman, Houston, Texas, USA
Piotr Kuśnierzcyk, Wroclaw, Poland
Mary Leffell, Baltimore, Maryland, USA
Robert E. Lewis, Jackson, Mississippi, USA
Martin Maiers, Minneapolis, Minnesota, USA
Steven G.E. Marsh, Hampstead, London, UK
James Mathew, Chicago, Illinois, USA
Neema P. Mayor, London, UK
Thalachallour Mohanakumar, Phoenix, Arizona, USA
Dimitri Monos, Philadelphia, Pennsylvania, USA
Allen Norin
Paul J. Norman, Denver, Colorado, USA
Jeffrey L. Platt, Ann Arbor, Michigan, USA
Elaine Reed, Los Angeles, California, USA
Nancy Reinsmoen, Scottsdale, AZ, USA
James Robinson, London, UK
Alessandro Sette, La Jolla, California, USA
Ethan Shevach, Bethesda, Maryland, USA
Peter Stasny, Dallas, Texas, USA
Anat Tambur, Chicago, Illinois, USA
John Trowsdale, Cambridge
George Vlad, New York, New York, USA
Andrea A. Zachary, Louisville, Tennessee, USA
Adriana Zeevi, Pittsburgh, Pennsylvania, USA
Xiaohai Zhang, Los Angeles, California, USA
GUIDE FOR AUTHORS

INTRODUCTION

*Human Immunology* publishes full-length, original, hypothesis-driven basic and clinical research articles as well as brief communications, reviews and editorials covering immunogenetics, transplantation immunology, autoimmunity, and immunity to infectious diseases in humans. It publishes short population reports, which are linked to the [allelefrequencies.net](http://allelefrequencies.net) database, describing the allele and haplotype frequencies of HLA and KIR.

A complete description of the journal's aims, scope and research areas can be found on the [home page](http://www.elsevier.com/locate/humimm).

**TYPES OF PAPERS**

**Research papers**

A full-length report of original, hypothesis-driven basic or clinical research, with new data, investigated using the scientific method, may be submitted as a research paper.

- Limit: 4000 words excluding references, tables, and figures
- Abstract: 200 words maximum
- References: up to 75

**Brief communications**

A short report of a distinct novel observation arising from hypothesis-driven basic or clinical research, investigated using the scientific method, may be submitted as a brief communication.

- Limit: 2500 words
- Abstract: 150 words maximum
- References: up to 30

Research papers and brief communications should include the following sections: Title Page (including an abbreviated title of not more than 45 characters and spaces) Abstract (number of words specified above) Keywords (up to 5) Abbreviations (list of abbreviations used) Introduction Materials and Methods Results Discussion Acknowledgements References Tables, Figure Legends, and Figures.

**Review Articles**

Review articles should focus on areas in which there has been recent significant progress by a number of laboratories and investigators. No previously unpublished results should be included. Invited review articles will get priority over uninvited submissions.

- Limit: 5000 words, excluding references, tables, and figures
- Abstract: 200 words maximum
- References: up to 80

Review articles should include the following sections: Title Page (including an abbreviated title of not more than 45 characters and spaces) Abstract (number of words specified above) Keywords (up to 5) Abbreviations (list of abbreviations used) Introduction Discussion Conclusions Acknowledgements References Tables, Figure Legends, and Figures.

**Short Population Reports**

Structured descriptions of reference populations, populations of anthropological interest, and control populations for disease studies, with associated genetic data and minimal analysis, can be published in *Human Immunology* as peer-reviewed Short Population Reports.

*Human Immunology* has partnered with the Allele Frequencies Net Database (AFND) to archive and make publically accessible the primary genotype, allele frequency and haplotype frequency data for the HLA and KIR genes from these population studies, along with demographic data for each population. Both unambiguous and ambiguous genotype data, with information on how the ambiguities were resolved, are requested.

Details of the AFND data-submission process can be found at [www.allelefrequencies.net/submit](http://www.allelefrequencies.net/submit).

The subsequent instructions for submitting Short Population Reports must be followed exactly:

Demographic data must first be submitted to AFND.
If the data is HLA, the type of each individual must be added to AFND.

If the data is KIR, a file containing each individual type must be sent to Derek.middleton@rlbuht.nhs.uk.

Following checking and ratification of the data at AFND, authors will be informed that they may now submit the Short Population Report to *Human Immunology*.

The title of a Short Population Report should include the name of the population and its geographic region of origin in no more than 150 characters.

The body of a Short Population Report should include the following in no more than 1000 words:

* A description of the geographic origin of the population, indicating the general region where the samples were collected, and the region to which the population is indigenous if these locations differ.
* A brief anthropological and demographic overview of each population's history, including information regarding potential ancestral populations, the history of migrations and any changes in the historical range of the population, and the degree and extent of contact with neighbors or other populations.
* A summary of the languages spoken by the members of the population, along with any pertinent historical linguistic information.
* A summary of any relevant cultural or ethnographic information for the population (e.g., ethnic distinctions, marriage patterns, caste structures).

A description of the methods employed in obtaining samples, including: the rationale for collecting the population sample, the rationale for selecting the sites from which the samples were obtained, information regarding the degree of relatedness among individuals, and information on whether or not data was collected in a disease study.

A summary of the typing methods used to generate the genotype data for this population.

Up to 10 citations of previous genetic studies on the population, for both immunogenetic and non-immunogenetic markers.

The following three types of analyses of the genotype data: tests of deviation from Hardy-Weinberg expectations, calculation of allele frequencies, and when multi-locus data are presented, estimation of haplotype frequencies (or calculation of haplotype frequencies if phase is known).

Allele and haplotype frequency tables should be included as supplemental data.

Authors are encouraged to submit reports that describe all commonly typed loci of a specific gene family (e.g. all commonly typed HLA genes, or all commonly typed KIR genes) for a population in a single report. Multiple short population reports which add only incremental information for the same population will not be accepted. New short population report manuscript submissions should describe a population or gene family that the author(s) has not described before.

For example:

**Acceptable** - descriptions of KIR loci in a population for which HLA genes have previously been described.

**Not acceptable** - a new report describing HLA-B in a population for which an HLA-A report has been published.

**Not acceptable** - a new report describing additional KIR genes for a population in which other KIR genes have already been described in a short population report.

Any additional work deemed insufficient to warrant publication as a new short population report can still be submitted to AFND.

**FOR ALL TYPES OF PAPERS**

The topics of all papers submitted to *Human Immunology* should fall within the aims and scope of the journal.

The title page should include the names and affiliations of the authors, the complete address, e-mail address, and telephone number of the corresponding author.

Papers should be divided into clearly defined, labeled and numbered sections.

Writing should be clear and concise. English should be easily understandable with proper grammar and spelling.
All submissions should include a cover letter including the following:
A statement that the manuscript is being submitted to *Human Immunology*. Those aspects of the journal's aims and scope to which the manuscript pertains. That the manuscript has not been published and is not currently under consideration by any other journal. That all authors have contributed to the submitted work, and approve the manuscript and its submission to the journal. That any novel HLA sequences have already been checked and named at [IPD-IMGT/HLA](http://www.elsevier.com/locate/humimm).

**COMPLIANCE WITH REPORTING GUIDELINES**
As applicable, manuscripts must be in compliance with the following guidelines for reporting: Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), Strengthening the Reporting of Genetic Association studies (STREGA), Strengthening the REporting of Immunogenomic Studies (STREIS), Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), Meta-analysis Of Observational Studies in Epidemiology (MOOSE).

A statement that the authors have followed the applicable reporting guidelines and their associated checklists (specify which guidelines were followed) should be included in the methods section of the manuscript.

**Contact details for submission**
Submission of manuscripts to this journal proceeds totally online, by means of the electronic submission tool (EES) at [http://ees.elsevier.com/him](http://ees.elsevier.com/him)

**SUBMISSION CHECKLIST**
Use this list to carry out a final check of your submission before you submit it to the journal for review. Please check the relevant sections 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 Telephone number

All necessary files have been uploaded: Cover letter Manuscript file:
- Include keywords
- All figures (including 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 checked for English grammar. Manuscript sections and subsections are numbered. All references mentioned in the Reference List are cited in the text, and vice versa. All figures and tables included with the submission are referred to in the text, an vice versa. Permission has been obtained for use of copyrighted material from other sources (including the Internet). Relevant declarations of conflicts of interest have been made. Journal policies detailed in this guide have been reviewed.

Referee suggestions and contact details are provided, based on journal requirements.

Note: Institutional email addresses must be provided for referees; suggested referees for whom institutional email addresses are not provided will not be invited for peer-review.

For further information, visit our Support Center.

**DETAILS FOR SUBMISSION**
Submission of manuscripts to *Human Immunology* occurs online at [http://ees.elsevier.com/him](http://ees.elsevier.com/him)

**BEFORE YOU BEGIN**

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

**Studies in humans and animals**
If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the
Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms sex and gender should be used correctly.

Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

All animal experiments should comply with the ARRIVE guidelines and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, EU Directive 2010/63/EU for animal experiments, or the National Institutes of Health guide for the care and use of Laboratory animals (NIH Publications No. 8023, revised 1978) and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

Declaration of interest
All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'Declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal’s official records. It is important for potential interests to be declared in both places and that the information matches. More information.

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

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

Contributors
Each author is required to declare his or her individual contribution to the article: all authors must have materially participated in the research and/or article preparation, so roles for all authors should be described. The statement that all authors have approved the final article should be true and included in the disclosure.

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

**Clinical trial results**

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

**Reporting clinical trials**

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

**Registration of clinical trials**

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

**Copyright**

Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

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

**Author rights**

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

Elsevier supports responsible sharing

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

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

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

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

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

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

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

Creative Commons Attribution (CC BY)
Lets 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, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The gold open access publication fee for this journal is USD 2650, excluding taxes. Learn more about Elsevier's pricing policy: 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.

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

Submission
Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.

Submit your article
Please submit your article via http://ees.elsevier.com/him/

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

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

Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Material and methods
Provide sufficient detail to allow the work to be reproduced, with details of supplier and catalogue number when appropriate. 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.

Essential title page information
• **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
  • **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lowercase superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
  • **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**
  • **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract
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 5 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, "and", "of"). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Abbreviations
Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements
Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Formatting of funding sources
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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 GenBank’s sequences.

Example: GenBank accession nos. **AI631510**, **AI631511**, **AI632198**, and **BF223228**, a B-cell tumor from a chronic lymphatic leukemia (GenBank accession no. **BE675048**), and a T-cell lymphoma (GenBank accession no. **AA361117**).

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.

**Footnotes**

Footnotes should be used sparingly. Number them consecutively throughout the article, using superscript Arabic numbers. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, footnotes in the text should be defined on the page on which they appear. Do not include footnotes in the Reference list.

**Table footnotes**

Indicate each footnote in a table with a superscript lowercase letter.

**Electronic artwork**

**General points**

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

A detailed guide on electronic artwork is available.

**You are urged to visit this site; some excerpts from the detailed information are given here.**

**Formats**

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

- **EPS (or PDF):** Vector drawings, embed all used fonts.
- **TIFF (or JPEG):** Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.
- **TIFF (or JPEG):** Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.
- **TIFF (or JPEG):** Combinations bitmapped line/halftone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

**Color artwork**

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) 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. Supply captions separately, not attached to the figure. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables
Each table should be typed double-spaced on a separate page, and numbered consecutively in accordance with their appearance in the text. Table titles should be informative, with detailed information appearing as footnotes. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Use only horizontal rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

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. 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.

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

Reference style
Text: Indicate references by 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 journal publication with an article number:
Reference to a book:
Reference to a chapter in an edited book:
Reference to a website:
Reference to a dataset:

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

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

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

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

Supplementary material captions
Each supplementary material file should have a short caption which will be placed at the bottom of the article, where it can assist the reader and also be used by search engines.
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
Human Immunology is now partnered with Data in Brief! You have the option of converting any or all parts of your raw research data into one or more data articles that host and describe your data. Data in Brief articles can be submitted as an additional file directly alongside your original research manuscript by using this template. If your research article is accepted by Human Immunology, your data article will automatically be transferred over to Data in Brief, where it will be independently reviewed, indexed, given a DOI and made publicly available online upon publication. An open access fee of 500 USD will be payable upon acceptance and publication of your data article in Data in Brief.
Full details can be found on the Data in Brief homepage.

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

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

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

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