DESCRIPTION

Comparative Biochemistry & Physiology (CBP) publishes papers in comparative, environmental and evolutionary physiology.

Part D: Genomics and Proteomics, focuses on omics" approaches to physiology, including comparative and functional genomics, metagenomics, transcriptomics, proteomics, metabolomics, and lipidomics. Most studies employ omics and/or system biology to test specific hypotheses about molecular and biochemical mechanisms underlying physiological responses to the environment. We encourage papers that address fundamental questions in comparative physiology and biochemistry rather than studies with a focus that is purely technical, methodological or descriptive in nature.

All four CBP journals, receive editorial direction from all the major societies in the field European Society for Comparative Physiology and Biochemistry, Chinese Association for Physiological Sciences, Japanese Society for Comparative Physiology and Biochemistry, Canadian Society of Zoologists (CBP Section), Society for Experimental Biology, (formerly the American Society for Zoologists) Society for Integrative and Comparative Biology, Australian and New Zealand Society for Comparative Physiology and Biochemistry, Russian Physiological Society.

IMPACT FACTOR

2017: 2.913 © Clarivate Analytics Journal Citation Reports 2018
ABSTRACTING AND INDEXING

Current Contents  
EMBASE  
EMBiology  
Scopus  
ISI  
CISTI  
Abstracts on Hygiene and Communicable Diseases  
Animal Breeding Abstracts  
Biochemistry & Biophysics Citation Index  
Biological Abstracts  
BIOSIS Previews  
CAB Abstracts  
CSA Neurosciences Abstracts  
Calcium and Calcified Tissue  
Dairy Science Abstracts  
Entomology Abstracts  
Excerpta Medica  
Genetics Abstracts  
Global Health  
Immunology Abstracts  
Index Veterinarius  
Nutrition Abstracts and Reviews Series  
Poultry Abstracts  
Protozoological Abstracts  
Reactions Weekly  
Review of Medical and Veterinary Mycology  
Tropical Diseases Bulletin  
Veterinary Bulletin  
Zoological Record  
Abstracts of Mycology  
British Library Inside

EDITORIAL BOARD

Editor-in-Chief:
Chris Martyniuk, University of Florida, Gainesville, Florida, USA

Associate Editors:
Jordi Altimiras, Linköping Universitet, Linköping, Sweden  
Cardiac pathological hypertrophy, evolution of reptiles into birds  
Gary Anderson, University of Manitoba, Winnipeg, Manitoba, Canada  
Physiology, endocrine mechanisms in fish  
Nicholas Bernier, University of Guelph, Guelph, Ontario, Canada  
Physiological and endocrine mechanisms, neuroendocrine stress response, hypoxia, hypotension  
David Buchwalter, North Carolina State University, Raleigh, North Carolina, USA  
Comparative physiology, trace metals, temperature, respirometry, hypoxia, aquatic insects, ecological indicators  
Paul Else, University of Wollongong, Wollongong, New South Wales, Australia  
Role of membrane lipids in the biology of organisms  
Elena Fabbri, Università di Bologna, Ravenna, Italy  
Cell signalling; mechanisms of action; hormones; endocrine disruptors; emerging contaminants in the environment; biomarkers  
Peter Fields, Franklin & Marshall College, Lancaster, Pennsylvania, USA  
Biochemical mechanisms and cellular responses to abiotic stresses, proteomics  
Donald Mykles, Colorado State University, Fort Collins, Colorado, USA  
Molecular mechanisms that control molting, muscle atrophy and limb regeneration in crabs  
Matthew L. Rise, Memorial University of Newfoundland, St. John’s, NL, Canada  
Genomics, reproduction, development, growth, responses to pathogens and environmental stressors  
Holly Shiels, University of Manchester, Manchester, England, UK
Cardiac physiology in ectotherms, electrophysiology, fluorescence microscopy, immunocytochemistry, immunohistochemistry,

Aldo Giuseppe Viarengo, Mario Negri Istituto di Ricerche Farmacologiche (IRCCS), Milano, Italy

Mechanisms of heavy metal homeostasis and toxicity, effects of environmental stressors on cell signaling and functions, pollutants and oxidative stress, utilization of biomarkers in biomonitoring programs, development of new bioassays

International Editorial Board:

Michael Berenbrink, University of Liverpool, Liverpool L69 3BX, UK
Respiratory systems of vertebrates, physiological mechanisms

Kênia Bícego, Universidade Estadual Paulista (UNESP), Jaboticabal - SP, Brazil
Comparative physiology, behavioral strategies used by ectothermic and endothermic vertebrates in response to stress, thermoregulation

Francisco Bozinovic, Pontificia Universidad Católica de Chile, Santiago, Chile
Ecological and evolutionary physiology, comparative physiology

Kevin Brix, University of British Columbia, Vancouver, British Columbia, Canada
Environmental toxicology, environmental physiology, ion regulation, acid-base balance and nitrogen balance

Leslie Buck, University of Toronto, Toronto, Ontario, Canada
Comparative physiology, biochemistry and neurobiology of anoxia tolerance

Carol Bucking, York University, Toronto, Ontario, Canada
Effects of digestion on the physiology of fish, role of the environment on physiology

Brad Buckley, Portland State University, Oregon, Oregon, USA
Physiological responses of marine species to elevated temperature and other stressors

Karen Burnett, College of Charleston, Charleston, South Carolina, USA
Immunology, cell biology and cell signaling, genetics, transcriptomics

Louis Burnett, Grice Marine Laboratory, Charleston, South Carolina, USA
Comparative physiology of respiration, ion and acid-base regulation in marine organisms

Nicholas Bury, University of Suffolk, Ipswich, UK
Aquatic toxicology, stress physiology and environmental monitoring

K. Campbell, University of Manitoba, Winnipeg, Canada
Ecology and evolution, diabetes

Christine Cooper, Curtin University, Perth, Western Australia, Australia
metabolic rate, evaporative water loss, body temperature, field metabolic rate, respirometry, environmental physiology, conservation physiology, myrmecophages

Paul Craig, University of Waterloo, Waterloo, Ontario, Canada
Epigenetic responses to environmental stressors

Daniel E. Crocker, Sonoma State University, Rohnert Park, California, USA
Comparative physiology of vertebrates, physiological ecology; bioenergetics, behavioral ecology, biology of marine mammals

Dane Crossley, University of North Texas, Denton, Texas, USA
Cardio-respiratory physiology, developmental physiology of vertebrates, reptilian and avian biology

Andrew Donini, York University, Downsview, Ontario, Canada
Salt, freshwater, aquatic insect, ammonia, epithelia, ion transport, aquaporins, water transport, septate junctions

Shaojun Du, University of Maryland School of Medicine, Baltimore, Maryland, USA
Genetic and epigenetic regulation of gene expression, muscle, bone and adipocyte cell differentiation, molecular chaperones and protein stability, zebrafish models, gene transfer and genome editing

Andrew Esbaugh, University of Texas at Austin, Port Aransas, Texas, USA
Environmental physiology; respiratory gas exchange; acid-base and osmoregulatory balance; the evolution of physiological systems; aquatic Toxicology

Shi-Jian Fu, Chongqing University, Chongqing City, China
Swimming performance, metabolic rate, phenotypic plasticity, specific dynamic action, thermal biology, hypoxia tolerance, locomotion, personality, consistent interindividual difference

Fritz Geiser, University of New England (AUS), Armidale, New South Wales, Australia
Ecological physiology, comparative physiology and biochemistry, thermoregulation and energetics, hibernation and daily torpor

Donovan German, University of California at Irvine, Irvine, California, USA
Nutritional physiology, comparative physiology, global change, biogeochemistry

Todd Gillis, University of Guelph, Guelph, Ontario, Canada
Mechanisms of vertebrate heart function, evolution of protein structure and function

Katie Gilmour, University of Ottawa, Ottawa, Ontario, Canada
Physiological, biochemical and molecular approaches to study stress in fish

Chris Glover, Athabasca University, Athabasca, Alberta, Canada
environmental physiology of aquatic organisms; epithelial transport of ions, nutrients and toxicants; aquatic toxicology; seafood safety

Kendra Greenlee, North Dakota State University, Fargo, North Dakota, USA
Evolutionary and ecological physiology

Helga Guderley, Université Laval, Ste. Foy, Quebec, Canada
Marine ecology, metabolism, physiology, zoology, mitochondria, skeletal muscle, environmental Physiology, comparative physiology, behavior

Raymond Henry, Auburn University, Auburn, Alabama, USA
Comparative physiology. function of carbonic anhydrase

Marcelo Hermes-Lima, Universidade de Brasilia, Brasilia, Brazil
Physiology, signal transduction, antioxidants, reactive oxygen species, oxidative stress, free radicals, lipid peroxidation, hypoxia, ischemia

James Hicks, University of California at Irvine, Irvine, California, USA
Oxygen transport, comparative and evolutionary approaches, modelling physiological systems

Wei Hu, Chinese Academy of Sciences (CAS), Wuhan, China
Fish, molecular breeding, reproductive endocrinology, sex determination, sex differentiation, sex reversal, primordial germ cells, gene transfer, gene editing

Pung Pung Hwang, Academia Sinica, Nankang, Taipei, Taiwan
Molecular physiology of ion regulation in zebrafish, functional genomics, stress physiology

Alex Ip, National University of Singapore, Singapore, Singapore
Biomimetics, ammonia toxicity, urea synthesis

Jorke Harmen Kamstra, Norges miljø- og biovitenskapelige universitet (NMBU), Oslo, Norway
Gene expression and regulation, genomics, epigenetics, transcriptomics, environmental toxicology

Barb Katzenback, University of Waterloo, Waterloo, Ontario, Canada
Environmental stress influence on immune system in amphibians

Christopher Kennedy, Simon Fraser University, Burnaby, British Columbia, Canada
Applied biology, toxicology, pest management

Valérie Langlois, Institut National de la Recherche Scientifique (INRS), Québec, Quebec, Canada
Ecotoxicogenomics, endocrine disruption; environmental and chemical toxicology; animal physiology; endocrinology; molecular biology

Gary Laverty, University of Delaware, Newark, Delaware, USA
Cell biology and physiology, molecular and microscopic/behavioral approaches

Jae-Seong Lee, Sungkyunkwan University (SKKU), Suwon, The Republic of Korea
Molecular ecotoxicology, comparative genomics, rotifers, copepods, killifish, oxidative stress, mechanistic toxicity, lipid metabolism, microplastics, emerging chemicals, ocean acidification

Xuefang Liang, Inner Mongolia University, Hohhot, Inner Mongolia, China
Aquatic toxicity testing technology, chemical and pesticide safety evaluation, Molecular ecotoxicology, Toxicogenomics

Harvey Lillywhite, University of Florida, Gainesville, Florida, USA
water balance, skin, cardiovascular, gravity, reptiles, snakes, frogs, physiological ecology, comparative physiology, herpetology, functional morphology

Stuart Linton, Deakin University, Geelong, Victoria, Australia
Energy metabolism, cellulose, lignocellulose, animal biochemistry, xylanases, enzyme analysis

Vlodymyr Lushchak, Precarpathian National University, Ivano-Frankivsk, Ukraine
Oxidative stress, aging, metabolism, environmental pollutants

Tyson MacCormack, Mount Allison University, Sackville, New Brunswick, Canada
Nanoparticle engineering, mechanisms of nanoparticle bioactivity or toxicity

Ed Mager, University of North Texas, Denton, Texas, USA
fish physiology, ecotoxicology, PAHs, crude oil, metals, water quality

Grant McClelland, McMaster University, Hamilton, Canada
Ontogeny, Phenotypic plasticity and evolution of muscle metabolism, Integrative animal physiology, Biochemistry, Molecular biology

Marshall McCue, St. Mary's University, San Antonio, Texas, USA
Comparative and evolutionary physiology, food and nutrition, bioenergetics, metabolism

Danielle McDonald, University of Miami, Miami, Florida, USA
whole animal physiology, transport and receptor physiology, stress, serotonin, pharmacology, pharmaceutical toxicology, PAH toxicology

Matteo Minghetti, Oklahoma State University, Stillwater, Oklahoma, USA
Metal homeostasis, fish physiology, cell biology, molecular ecotoxicology

Carlos Navas, Universidade de São Paulo (USP), Sao Paulo, Brazil
Physiological ecology, herpetology, ecological climate change, thermal physiology, thermal ecology
Kristin O'Brien, University of Alaska Fairbanks, Fairbanks, Alaska, USA
Fish physiology and biochemistry, adaptations to cold temperature, bioenergetics

Berry Pinshow, Ben Gurion University of the Negev, Beer Sheva, Israel

Jason Podrabsky, Portland State University, Oregon, Oregon, USA
Effects of climate warming, ocean acidification, and hypoxia on marine animals and ecosystems

Hans-Otto Pörtner, Alfred-Wegener Institut - Helmholtz-Zentrum für Polar- und Meeresforschung, Bremerhaven, Germany

Berry Pinshow, Ben Gurion University of the Negev, Beer Sheva, Israel
Fish physiology and biochemistry, adaptations to cold temperature, bioenergetics

Gregory Pyle, University of Lethbridge, Lethbridge, Alberta, Canada
Fish, aquatic invertebrates, amphibians, olfaction, chemical communication, behaviour, chemosensory neurophysiology, aquatic ecotoxicology, metals, oil sands, hydrocarbons

Jeffrey Richards, University of British Columbia, Vancouver, British Columbia, Canada
Molecular mechanisms of cellular responses to environmental stress

Aaron Roberts, University of North Texas, Denton, Texas, USA
Ecotoxicology, effects of environmental stressors on aquatic organisms

Meldrum Robertson, Queen's University, Kingston, Ontario, Canada
Comparative animal physiology, neuroethology, cellular neurobiology, insect behavior

Kathy Schuller, Flinders University, Adelaide, South Australia, Australia
Fatty acid metabolism, metabolic biochemistry, thermoregulation

Patricia Schulte, University of British Columbia, Vancouver, British Columbia, Canada
Molecular biology, biochemistry, physiology, genomics, population genetics, evolutionary biology

Graham Scott, McMaster University, Hamilton, Ontario, Canada
Evolutionary physiology, Respiratory physiology, Energy metabolism, Environmental stress, Hypoxia, High altitude, Mammals, Birds, Fish

Frank Seebacher, The University of Sydney, Sydney, New South Wales, Australia
Physiological ecology, evolutionary physiology, thermal biology, heat transfer, ectothermy, endothermy, cardiac function, heart rate, reptiles, crocodilians, dinosaurs, lizard

Helmut Segner, Universität Bern, Bern, Switzerland
Aquatic ecotoxicology, cytoprotective systems, hormone-active chemicals

Katherine Sloman, University of the West of Scotland, (West) Paisley, Scotland, UK
Physiology and nutrition of aquacultured and wild fishes

Judit Smits, University of Saskatchewan, Saskatoon, Saskatchewan, Canada
Ecotoxicology

Inna Sokolova, Universität Rostock, Rostock, Germany
Environmental physiology and toxicology of marine organisms, adaptation to environmental stressors, effects of environmental change

George Somero, Stanford University, Pacific Grove, California, USA
Biochemical and physiological adaptation to physical and chemical stressors

James Staples, University of Western Ontario, London, Ontario, Canada
Hibernation metabolism

Tomohiko Suzuki, Kochi University, Kochi, Japan

Yoshio Takei, The University of Tokyo, Chiba, Japan
Fish biology, receptors, fish migration

Akihiro Takemura, University of the Ryukyus, Okinawa, Japan
Aquaculture, biological rhythm, circadian, coral reef, fish, gonadotropin, lunar cycle, melatonin, ovary, reproduction, sex steroids, tide, Internal and external regulation of enigmatic rhythms in fish and marine invertebrates, reproductive physiology, biological clock

Glen Van Der Kraak, University of Guelph, Guelph, Ontario, Canada
Reproductive physiology, endocrine disruption

Mathilakath Vijayan, University of Calgary, Calgary, Alberta, Canada
Cellular and molecular mechanisms of stress tolerance

Deshou Wang, Southwest University, Chongqing, China
Fish endocrinology and reproduction, Sex determination and differentiation, Sex steroids

De-Hua Wang, Chinese Academy of Sciences (CAS), Beijing, China
Metabolic rate, thermogenesis, thermoregulation, thermal physiology, energy metabolism, mammals

Shi Wang, Ocean University of China, Qingduo, China
Marine Genomics, Genome Sequencing, Genotyping, Gene Expression, Epigenetics, Evolution, Shellfish

Shiqiang Wang, Peking University, Beijing, China

Tobias Wang, Aarhus University, Århus C, Denmark
Human cellular physiology, comparative animal physiology, ecological physiology, comparative biochemistry
**Shugo Watabe**, Kitasato University, Kanagawa, Japan
muscle biochemistry, environmental adaptation, marine genomics and biotechnology

**Andrew Whitehead**, University of California, Davis, Davis, California, USA
Genomics, comparative genomics

**Philip Withers**, University of Western Australia, Crawley, Western Australia, Australia
Comparative physiology, amphibians and reptiles, metabolism, thermoregulation, water and solute balance, phylogenetic methods, biostatistics

**Tianjun Xu**, Shanghai Ocean University, Shanghai, China
Innate immune; Signaling pathway; Molecular regulation; Immune gene evolution; Non-coding RNA; microRNA

**Tania Zenteno-Savín**, Centro de Investigaciones Biologicas del Noroeste, S.C. (CIBNOR), Playa Palo Santa Rita, La Paz, Baja California Sur, Mexico
Oxidative stress
The journal publishes original articles emphasizing comparative and environmental aspects of the physiology, biochemistry, molecular biology, pharmacology, toxicology and endocrinology of animals. Adaptation and evolution as organizing principles are encouraged. Studies on other organisms will be considered if approached in a comparative context.

Part A. Molecular and Integrative Physiology covers molecular, cellular, integrative, and ecological physiology. Topics include bioenergetics, circulation, development, excretion, ion regulation, endocrinology, neurobiology, nutrition, respiration, and thermal biology. Studies on regulatory mechanisms at any level or organization such as signal transduction and cellular interactions and control of behaviour are encouraged.

Part B. Biochemistry and Molecular Biology covers biochemical and molecular biological aspects of metabolism, enzymology, regulation, nutrition, signal transduction, promoters, gene structure and regulation, metabolite and cell constituents, macromolecular structures, adaptational mechanisms and evolutionary principles.

Part C. Toxicology and Pharmacology covers chemical and drug action at different levels of organization, biotransformation of xenobiotics, mechanisms of toxicity, including reactive oxygen species and carcinogenesis, endocrine disruptors, natural products chemistry, and signal transduction. A molecular approach to these fields is encouraged. Measured rather than nominal exposure concentrations of toxicants must be reported whenever possible. For water-borne exposures of aquatic organisms, reporting of detailed chemistry data for the exposure waters is encouraged. When reporting data obtained from bioassays (e.g., LC50 tests), raw data (i.e., the value of the measured biological response variable(s) for each treatment and each observation time) should be submitted as online supplementary material.

Part D. Genomics and Proteomics covers the broader comprehensive approaches to comparative biochemistry and physiology that can be generally termed as "-omics", e.g., genomics, functional genomics (transcriptomics), proteomics, metabolomics, and underlying bioinformatics. Papers dealing with fundamental aspects and hypotheses in comparative physiology and biochemistry are encouraged rather than studies whose main focus is purely technical or methodological.

Naturally, a certain degree of overlap exists between the different sections, and the final decision as to where a particular manuscript will be published after passing the rigorous review process lies with the editorial office.

Types of articles published in CBP journals
A Research Paper is a paper that focuses on an experimental question of broad interest to the comparative physiology community.
• Word count (excluding references): typically 4000 -8000 words, with at least 2 figures / tables.
• Papers are normally subdivided into sections titled: Abstract, Introduction, Materials and Methods, Results, Discussion, and References. Results and discussion may be combined if appropriate.

A Short Communication is like a Regular Article in scope, but is of a nature that a complete story can be presented in a brief communication. As Short Communications are expected to have higher than average impact on the field rather than report on incremental research, they will receive prioritized and rapid publication.
• Word count: less than 3000 words, with no more than 2 figures / tables.
• Each paper will begin with "Short Communication:" followed by the title.
• The paper includes and Abstract, but is otherwise not subdivided into sections.

A Methods article is focused on applying a novel technology or approach that would inform the CBP readership about a novel technology applied to a comparative physiology question.
• Word count: typically less than 3000 words, with no more than 2 figures / tables.
• Each paper will begin with "Methods:" followed by the title.
• The paper is subdivided into abstract, background, methods, applications.

An Invited Review is a submission that is solicited by an Editor-in-Chief, Associate Editor or member of the Editorial Board. An invited review is published with free access for the first year.

• Word count: typically 6,000-10,000, with 2 or more figures / tables.

• Each paper will begin with "Invited Review:" followed by the title.

A Review article can be submitted without a specific invitation, but authors are encouraged to request input form the appropriate Editor-in-Chief to ensure that the paper falls within the scope of the journal. Each paper will begin with "Review" followed by the title. The paper is not subdivided into sections. A review is published with free access for the first year.

• Word count: typically 6,000-10,000 words, with 2-4 figures or tables

• Each paper will begin with "Review:" followed by the title.

A Commentary is a more narrowly written review, typically focused on a specific concept of immediate importance to the discipline. While it is expected that authors survey the peer-reviewed literature on the subject, a Commentary paper offers more room for more speculative consideration of a topic. Authors are advised to contact the Editor-in-Chief to determine if your topic is suitable.

• Word count: less than 3000 words, with no more than 2 figures / tables.

• Each paper will begin with "Commentary:" followed by the title.

• The paper is not normally subdivided into sections

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
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.

**Preprints**

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

**Use of inclusive language**

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

**Changes to authorship**

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

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

**Copyright**

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

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

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

**Author rights**

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

Elsevier supports responsible sharing

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

**Role of the funding source**

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.
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 3000, 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 open access page for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. Find out more.

This journal has an embargo period of 12 months.

Elsevier Researcher Academy
Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.
Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's 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.

Referees
Please submit, with the manuscript, the names, addresses and e-mail addresses of six potential referees. Include a DOI (digital object identifier) for the most recent paper from this author that relates to the work under review. Please ensure that at least 3 of the referees are from a different country than that of the submitting author's institution. Include at least one member of the Editorial Board amongst your selection. The Editorial Office may not use your suggestions, but they are greatly appreciated.

PREPARATION

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

Use of word processing software
Initial submission must be as a single, complete PDF file. When using word-processing software, it is important that the file be saved in the native format of the word processor used (e.g. doc, docx, odt, etc). The text should be in single-column format and layout of the text should be kept as simple as possible. Authors should not use the word processor's options to justify text or to hyphenate words. However, bold face, italics, subscripts, superscripts etc. can be included. When preparing tables, if you are using a table grid, use only one 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: https://www.elsevier.com/guidepublication. Note that source files of figures, table and text graphics will be required for publication, but are not needed during the review process. Most word-processing programmes (Word, Word-Perfect, OpenOffice, LibreOffice, etc.) possess built in PDF makers. Resulting PDF files should be checked very carefully, especially for transposition of mathematical and other symbols and non-standard characters. SI units must be used.

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

Article structure
Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.
Material and methods
Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

Statistics
Submissions are incomplete without detailed information on independent replication of experiments, statistical approaches and statistical analysis.

Theory/calculation
A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

Results
Results should be clear and concise.

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

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

Appendices
If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information
• Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
• Author names and affiliations. Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a 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.

If submitting a Review article, write "REVIEW" at the top of the title page.

Abstract
A concise and factual abstract of a maximum of 250 words 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.

The abstract should be a single paragraph not exceeding 250 words.

Up to eight key words, which may or may not appear in the title, should be listed in alphabetical order after the abstract. Only these key words, together with the title, 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.

Genbank
DNA sequences and GenBank Accession numbers
Many Elsevier journals cite "gene accession numbers" in their running text and footnotes. Gene accession numbers refer to genes or DNA sequences about which further information can be found in the database at the National Center for Biotechnical Information (NCBI) at the National Library of Medicine. Elsevier 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 capitalised. (See Example 1 below). This combination of letters and format will enable Elsevier's typesetters to recognize the relevant texts as accession numbers and add the required link to GenBank's sequences.

Example 1: "B-cell tumor from a chronic lymphatic leukemia (GenBank accession no. BE675048), and a T-cell lymphoma (GenBank accession no. AA361117)."

Authors must check accession numbers 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 (see Example 2 below).

Example 2: "B-cell tumor from a chronic lymphatic leukemia (GenBank accession no. BE675048), and a T-cell lymphoma (GenBank accession no. AA361117)."

In the final **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 (see Example 3 below).

Example 3: "B-cell tumor from a chronic lymphatic leukemia (GenBank accession no. BE675048), and a T-cell lymphoma (GenBank accession no. AA361117)."
Footnotes
Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Artwork
Electronic artwork
General points
• Make sure you use uniform lettering and sizing of your original artwork.
• Embed the used fonts if the application provides that option.
• Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
• Number the illustrations according to their sequence in the text.
• Use a logical naming convention for your artwork files.
• Provide captions to illustrations separately.
• Size the illustrations close to the desired dimensions of the published version.
• Submit each illustration as a separate file.
A detailed guide on electronic artwork is available.
You are urged to visit this site; some excerpts from the detailed information are given here.

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

Please do not:
• Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
• Supply files that are too low in resolution;
• Submit graphics that are disproportionately large for the content.

Color artwork
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF) or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) in addition to color reproduction in print. 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
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. Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

1. All publications cited in the text should be presented in alphabetical order in a list following the text of the manuscript.
2. In the text refer to the author's name and year of publication.
3. If reference is made in the text to a publication written by more than two authors the name of the first author should be used followed by "et al.". In this list names of first authors and all co-authors should be mentioned.
4. References cited together in the text should be arranged chronologically.
5. The List of references should be arranged alphabetically on authors' names, and chronologically per author. Names of all authors must be included. Do not use et al. Publications by the same author(s) in the same year should be listed as 2000a, 2000b, etc. Follow the relevant examples below.


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 style

Reference style (see sample manuscript link)
Name and year style in the text

Text: All citations in the text should refer to:
1. Single author: the author's name (without initials, unless there is ambiguity) and the year of publication;
2. Two authors: both authors' names and the year of publication;
3. Three or more authors: first author's name followed by 'et al.' and the year of publication. Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically. Examples: 'as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999). Kramer et al. (2010) have recently shown ...'

**List:** References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication. Note that any (consistent) reference style and format may be used: the Publisher will ensure that the correct style for this journal will be introduced for the proof stages, the final print version and the PDF files for electronic distribution.

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

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

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

**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).

**Submission check list at a glance**
The following list will be useful during the final checking of an article prior to uploading it to the journal's website http://editorialexpress.com/cbp. Please consult this Guide for Authors for further details of any item.
Ensure that the single, complete PDF file contains:

One author designated as the corresponding author with complete contact details (email address, full postal address, phone and fax numbers
Keywords
Line numbers
All figures
All figure captions
All tables (including title, description, footnotes
References in proper format (in text and in reference section)

For successful electronic submission, authors also have to have to hand:

- cover letter (pdf or word-processing format) for upload or cut-and-paste
- a list of 5 or more researchers (names, affiliations and e-mail address), with expertise in the areas covered in the manuscript and who might be considered as suitable referees for the manuscript

Further considerations:

Manuscript has been 'spell-checked' and 'grammar-checked'
References are in the correct format for this journal
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 Web)
Colour figures are clearly marked as being intended for colour reproduction on the Web (free of charge) and in print, or to be reproduced in colour on the Web (free of charge) and in black-and-white print
If only colour in the Web is required, black-and-white versions of the figures are also supplied for printing purposes.

For any other information please visit our customer support site at http://support.elsevier.com

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.

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