

**BIOS Author Instructions**  
**Updated: May 2024**

**BIOS, a quarterly journal of biology and the journal  
of the Beta Beta Beta Biological Society, has been published since 1930.**

**BIOS has a three-fold purpose:**

1. To publish matters that pertain to the affairs of the Society
2. To publish articles by members
3. To publish articles that will be of general interest to biologists.

Many distinguished biologists have contributed manuscripts for publication in BIOS, written especially with the undergraduate reader in mind. Subjects covered include articles on current research, developments in biology, biology as a profession, biology education, and articles on graduate and professional training for biologists. Special emphasis is placed on the publication of undergraduate research papers.

BIOS is available online at BioOne.org and archived after one year at JSTOR.org.

**Author Charges**

There are no publishing charges for TriBeta members (one submission per year). Please provide the name and membership number of TriBeta member(s) as part of the submission process.

Page charges for non-members are \$30 per page, payable after the manuscript is accepted. Figures are \$40 per figure. Please note, for TriBeta members, submissions with more than two color figures will be subject to extra fees of \$40 per figure. Figures changed at the proofs stage (for any reason) will be subject to extra fees of \$40 per figure.

For author charges, an invoice will be created and emailed to you. Payment is preferred via PayPal; the link is provided on the invoice or the national office address is provided if mailing a check. Please include BIOS and the invoice number in the memo of your payment. Once paid, please email [BIOS@tribeta.org](mailto:BIOS@tribeta.org) so the payment can be recorded.

Manuscripts are reviewed by college and university faculty or researchers. Membership in TriBeta is not required for publication in BIOS, but members receive reduced publication costs.

BIOS submission takes several months. Please be patient. If corresponding about your submission be sure to include the manuscript number. Please note that a different number will be assigned when page proofs are generated. Be sure author contact information is kept current in the submission system. Submissions that require extensive changes and/or revisions will be delayed.

Upload submissions to BIOS: [www.editorialmanager.com/BIOS](http://www.editorialmanager.com/BIOS).

Questions should be addressed to the Editor:  
Nancy E. Todd Ph.D. [bios@tribeta.org](mailto:bios@tribeta.org)

## Journal policies

### Artificial Intelligence (AI) writing tools

Peer and Editorial review is personal, objective assessment of the submitted manuscript. Artificial Intelligence (AI) tools will not serve as reviewers, nor in the Editorial decisions.

The use of AI for checking grammar and spelling is very useful, but AI tools should not be used to write manuscripts submitted to BIOS. The potential for AI plagiarizing written content is a genuine concern and is a breach of ethical standards. AI models are trained on vast amounts of data, so there is always a risk that content produced may replicate someone else's work too closely (Elali and Rachid 2023).

Elali FR, Rachid LN. 2023. AI-generated research paper fabrication and plagiarism in the scientific community. *Patterns (N Y)*. 10;4(3):100706. doi: 10.1016/j.patter.2023.100706. PMID: 36960451; PMCID: PMC10028415

### Animal subject use

Humane and ethical treatment of animal subjects is of the utmost importance and studies that do not have approved protocols or do not follow best practice guidelines for animal use will not be considered for publication in BIOS. When submitting the manuscript there is a question that must be answered regarding animal use and care. If no animals are used, the question is answered "N/A". If any animals are used the question must be answered.

In the **Methods**, please indicate whether the study uses an approved protocol and include the protocol number or explanation if no number is assigned.

For invertebrate species or studies where IACUC protocol approval is not specifically required, a statement that Animal Care and Use Guidelines were followed should be included in the **Methods**, (and in answer to the submission question regarding animal use). **Studies that do not follow Animal Care and Use Guidelines are not publishable.**

### Permits

Permits for sample/subject collection, when required, must be obtained and this should be stated in the manuscript.

### Human subject use

Humane and ethical treatment of human subjects is of paramount importance, and studies that do not follow approved protocols are not publishable. When submitting the manuscript there is a question that must be answered regarding human subject use. If no human subjects are used the question is answered "N/A". If human subjects are used the question must be answered. **Studies that do not follow Institutional Research Board Guidelines for Human Subjects are not publishable.**

### **Use of cultured cells**

Many journals and funding agencies now require cell line authentication (tests to confirm a cell line is the correct species and, if possible, specific cell line, as well as tests to indicate contamination by microorganisms including mycoplasma). While BIOS will not uphold the guidelines in the strictest sense, knowing that undergraduate research is not always conducted in the most scrupulous manner, statements regarding the source, upkeep, and testing of cells lines is required.

In the **Methods**, please indicate the source of cells (including ATCC number if applicable), and whether cells have been tested for mycoplasma during the study. Cell lines that are known to be old (high passage number) and/or are cultured routinely in media containing antibiotics must be disclosed as such, so that readers have this information. If cells are found to be contaminated or cross-contaminated, this must be disclosed.

An excellent source on suggested practices is Geraghty, et al. 2014. Guidelines for the use of cell lines in biomedical research. British Journal of Cancer: [Guidelines for the use of cell lines in biomedical research | British Journal of Cancer \(nature.com\)](https://www.nature.com/articles/bjoc.2014.262)

### **Manuscripts of four types are considered for publication**

**Research Article:** Manuscripts describing a research study.

**Preliminary Report:** Manuscripts that describe a very small study, an observational or behavioral study where the period of observation was too brief to draw broad conclusions, a study describing negative results, or pilot study.

**The Biologists' Forum:** Review articles, opinion pieces, manuscripts on teaching or education, and other types of writings by faculty members or scientists. Please note that review articles should not be solely authored by undergraduates. We have found that the breadth of literature reviewed has not been up to publication standards when a 'senior author' is not intimately involved in the preparation of a review article.

**The Student's Forum:** See information regarding review articles in "The Biologists' Forum", above. Student-authored manuscripts that do not describe a research or preliminary study may be published in The Student's Forum. Students may write about laboratory or work experiences, college or graduate school searches, or any experience, opinion, or observation that would be of interest to readers of BIOS.

The Editor is happy to answer questions or render an opinion on whether a manuscript (or idea for a manuscript) is suitable for publication in BIOS. Manuscripts submitted to BIOS should not be published elsewhere.

## General instructions and Checklist

- **This is for author use only and does not need to be submitted with manuscripts**
- **Manuscripts that do not adhere to these instructions will be sent back to the corresponding author for revision before they are considered for review.**

Because BIOS is a general biology journal, please include an introduction suitable for a broad audience; jargon and specific terminology should be defined for the benefit of the undergraduate reader.

- Add continuous line numbers to the manuscript before submission.
- Carefully proofread for spelling and grammatical errors prior to submission.
- Do not number sections.
- Do not use an appendix.
- Do not include a Table of Contents.
- All scientific names should be italicized and spelled out at first use (*Escherichia coli*), and then subsequently abbreviated (*E. coli*).
- The passive voice is used in scientific reports. You may use “we” when stating the hypothesis and conclusions.
- Introduce abbreviations at first use in the Abstract and again at first use in the text.
- Use 12 point font (i.e. do not use different sized fonts for headings or titles), double spacing, and minimal formatting.
- Only the first letter of the first word of a title or heading (or a proper noun) is capitalized.
- Metric units should be used unless impractical.
- Use standard American English and standard scientific nomenclature.
- New terms, abbreviations, and symbols are defined at first occurrence.
- Footnotes are not to be used.
- Supplementary data are not to be used.
- Each table and figure must be referred to in the text in the order they appear, (i.e. the first figure referred to in the paper is Figure 1. If referred to in parentheses, please use (Fig. 1).
- Tables and Figures should be separate files.
- Level 1 Headings (Introduction, Methods, etc.) should be centered and bold text.
- Level 2 headings (subheadings) are left-justified and bold text, and the first word and proper nouns are capitalized.
- Do not use level 3 headings.
- Use “and” and not “&” in citations and references. Use of the ampersand (&) is discouraged except where appropriate, such as in trademarked names.
- After attaching manuscript, table, and figure files, you must view and approve the created PDF. Review it carefully, as the PDF is the only document the reviewers will see.
- Upon revision, attach a Word file and not a PDF for the manuscript (file type does not matter for initial submission).

### Style notes

- Spell out names of states in manuscript.
- Use DD MMM YYYY (ex: 12 Mar 2022) for specific dates.
- Use 3-letter abbreviations for months.
- Use “min” for minute/minutes. You may use h for hour but it is left to the author.

### Numbers and units

- =, <, >, +: leave a space before and after the symbol
- °C and %: no space between the number and the degree or percent symbol. Degree symbol is a superscripted lower-case o.
- Negative numbers take a minus sign (end dash, or short dash) with no space between the symbol and number (ex: -20°C)
- There should be a space between the number and the unit (ex: 1.5 mL).
- To abbreviate microliters, use the Greek symbol for m and not a “u” (uL).
- Use a capital L to abbreviate liters (ex: mL for milliliters).
- In almost all cases except where impractical, spell out numbers less than twenty, but use Arabic numerals for numbers twenty and greater, and for numbers with decimal points (ex: three samples were tested, the average size was  $1.6 \pm 0.2$  cm, 48 samples were...). In general, avoid beginning sentences with a number, as numbers at the beginning of a sentence are spelled out (ex: Ten microliters of each sample were run on a 1.0 % agarose gel...).
- Multiple measurements or observations are often expressed as mean plus or minus the standard error (often standard deviation). Use an underlined plus symbol in the text. Ex:  $15.2 \pm 0.45$  g.
- Use significant figures when applicable. A 1% solution could contain between 0 and 10 g of solute per 100 mL. A 1.0% solution contains between 1.0 and 1.4 g solute per 100.0 mL. For solutions made in house this will, of course, depend upon both the specific protocol and the skill of the worker, but it is encouraged to use precise measurement and document accordingly. Be consistent with style of number used in the text.

### Statistics

- “p” should be lower case and italicized, and there should be a space on either side of “<”, “=” or other symbol. Example  $p \leq 0.05$ .
- The Greek symbol Chi is created using symbol font for a lower case “c”.

### Detailed information on Manuscript Format

**Manuscript submission will take several hours. Provide clear, complete, answers to questions. Include the following in this order in the manuscript file.**

- Begin with the type of manuscript;**
  - Title
  - Author(s) and Affiliations
  - Short (running) head
  - “Correspondence to: e-mail”

Key Words (optional: alphabetized, and should not include terms found in the title or Abstract)

**Type of manuscript submitted**

(The Biologists' Forum, Research Article, Preliminary Report or The Student's Forum)

**Title** should be descriptive and specific.

- The title of the paper should only have the first word and proper nouns capitalized.
- BIOS has a strong preference for descriptive rather than vague titles. When possible, state the conclusion found in the study in the title.

**Authors**

- Include full names of each author (middle initials are encouraged; if this is your first publication consider what you will use as your professional name), and use "and" before the name of the last author. Include ORCID information if applicable when submitting, and include on title page.

**Affiliations**

- Provide department, college/university, city, state (use 2-letter state abbreviation) and zip for author affiliations in the text. If there are multiple affiliations, use superscripted numbers (1, 2, 3). If all authors have the same affiliation, no superscripted numbers are needed. (Ex: Department of Biology, Missouri Western State University, Saint Joseph, MO 64507)

**Correspondence to: email.** Use a stable institutional email address and not a gmail address (publication best practices discourage use of non-institutional addresses).

**Key words (Optional).** Alphabetized and do not include terms that appear in the title or abstract (title, abstract, and key words are all searchable). (Ex: Key words: archaea, DNA replication, polymerase delta).

**Running head:** a short running header, 50 characters maximum, with only the first letter of the first word and proper nouns capitalized. Use italics for organism and gene names, if appropriate. (Ex: Running head: Histone gene regulation in yeast)

**Abstract**

- Abstracts should be no more than 300 words.
- The abstract cannot contain citations.

"Forum" contributions do not require an abstract. This is left to the author.

**Introduction**

- The Introduction should be written for an undergraduate reader (i.e. define jargon at first use; aim introduction at a reader with general knowledge (general (college biology student) audience).
- The hypothesis should be clearly stated.

**Materials and Methods**

- Describe a reproducible study.

- Be clear about the number of organisms, number of replicates, and how data were gathered.
- Provide clear and concise summary of methods used
- Include information on Institutional Animal Care and Use Committee approvals for the study if it involves living animals, including the approved protocol number. Studies without an approved protocol cannot be published.
- For studies involving human subjects, state that the study uses an approved protocol and include the approved protocol number. Studies without an approved protocol cannot be published.

**Results**

- Explain what was found.
- Include raw data if appropriate.
- Include summarized data in appropriate form in figures and tables. Follow the formats listed below.
- Results and Discussion sections may be combined in Preliminary Reports if appropriate.

**Discussion**

- Discussion addresses the research question and puts the findings into perspective.
- Draw only those conclusions that can be supported by the results.
- Explain the findings with regard to what is previously known about the system.
- Return to the material presented in the Introduction section to complete the “story” of how this study adds to knowledge.
- Explain limitations of the study and, if appropriate, suggest further work.

**Acknowledgments**

- Brief statement acknowledging funding and other support for the study.

**References** and in-text citations

- Multiple in-text citations are listed chronologically (earliest year first) and separated by semi-colons (Winslow 2004; Marshall and Evans 2010; Jones et al. 2020).
- Use the Council of Science Editors (CSE) Name-Year in-text citation (Harvard style) except for the following: Alphabetize references in the References list. DO NOT use numbers for citations and do not number references as they are referred to in the text.
- You can find CSE style in EndNote and other citation/reference software.
  - “Quick guides” to CSE style can be found at

[Scientific Style and Format Online - Citation Quick Guide](#)  
[csecitationstyle.pdf \(tru.ca\)](#)

[CSE Style Guide | UNE Library Services](#)

**Author Contributions**

- Indicate each author’s contribution to the study  
 For example: AB, CD, and EFG conceived, designed, and orchestrated the work. EFG acquired funding and provided critical direction and oversight for the project. AB and CD collected and analyzed the results. All authors read and approved the final manuscript.

**Conflict of Interest Statement**

- Disclose conflict of interest or provide a statement such as “The authors declare no conflict of interest.”

☐ **Author Biographies** (optional)

- One-paragraph biographies to be included at the end of the published manuscript. Remember that it can take a year to see the manuscript in print (i.e. avoid statements like “X will graduate next month”).

☐ **Legends**

- Figure title/legends, Table titles.

☐ **Figures**

- Figures are submitted as separate files. The submission system will combine those files in the PDF for the reviewer. View the PDF carefully, as this is the only document the reviewers will see.
- Proofread your figures carefully for spelling. **Figures are submitted as “camera-ready”, meaning we will print whatever you submit. We cannot make changes to figures; this is the authors’ responsibility.**
- The first figure called out in the text is “Figure 1”. The word “Figure” should be spelled out in a sentence but is abbreviated as “Fig.” when in parentheses.
- Do not use borders or boxes around figures unless impractical.
- Only the first letter of the first word and proper nouns should be capitalized in the figure itself and in the figure title (the title should NOT be a part of the figure; it is included in the “Legend” section that follows the References section).
- Submit figure as either “color figure” or “black and white figure”. Be judicious about the use of color; not all graphs require color.
- Example of figure legend style:

**Figure 1.** Descriptive title of Figure 1 with only proper nouns capitalized. Descriptive legend for Figure 1. BIOS prefers figure legends that allow a reader to understand what is shown without having to refer to the text. When possible, include enough detail about the method so that a reader can interpret what is shown in the figure. Include number of subjects, replicates, and explanation of error bars if appropriate.

- Use panels when appropriate. Label panels with letters (a, b, c).
- Use images for which you hold copyright whenever possible. Use correct attribution when necessary (ex: Google maps). Do not reuse figures from other publications unless you have letters of permission from all copyright holders (this is uncommon).
- Figures should be submitted at print size or slightly larger. Line art (charts, drawings, etc.) should be submitted at 1200 dpi (same as ppi). Halftone art (grayscale, b/w photographs) should be submitted at 300 dpi. Color art (whether to be printed in color or in b/w) should be submitted at 450 dpi, but no lower than 300 dpi. See [Allen-Press-Guide to Art Preparation June 2016.pdf \(allenpress.com\)](https://www.kwglobel.com/support/digital-art-support/)

☐ **Tables**

- Use minimally formatted Word or Excel tables. **Do not use color or shading** – tables are formatted by the publisher. Colored tables are allowed if appropriate but are considered



figures; see the “color figures” information and submit the table as a figure (i.e. what you submit is exactly what will appear in the paper).

- Only the first letter of the first word and proper nouns should be capitalized in the table headings and entries. Use italics for species names and where appropriate.
- Table title should be included in the Legends section. We will format the table and include the title when the manuscript goes through composition
- Example of table title style:

**Table 1.** Descriptive title of Table 1 with only proper nouns capitalized (parenthetical statements, such as “n = 30”, are allowed).

Tables should have only a title. If there is more written explanation it must appear as a footnote(s) at the bottom of the table. If there is one footnote, our preference is to use a superscripted asterisk (\*). If there are multiple footnotes, superscripted lower-case letters (a, b, c) or numbers (1, 2, 3) are used. Letters are preferred except where they may be confusing to the reader. For footnotes indicating values of statistical significance, \* and \*\* may be used (even if letters or numbers are also used; this is left to the author).

### **Supplemental data**

BIOS does not allow supplemental information; all information should be included, including raw data where appropriate. Long tables are necessary for some works (for example, for observational surveys of flora or fauna). BIOS does not use Appendices; all information should be included in a figure or table. Some authors include a link to privately-hosted data.

If you wish to include supplementary or raw data for the reviewers, include it as a figure or table and indicate clearly that the data are shown only for reviewers in the title of the figure/table. Upon revision, remove the figure/table.