

## Scientific Writing Assignments for a Condensed Format Physiology Course

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**Author's Notes:** This series of assignments and grading rubrics on scientific writing were developed for an upper-division, majors class in physiology presented during an abbreviation (e.g., 4 week) summer session. An objective of the assignment was to immerse students in several aspects of the scientific writing process (i.e., consumption, creation, and peer-review) in a limited time frame. This series has also been used in a traditional, 15-week semester format. Restricting students to articles published in specific time frames and to specific journals as well as requiring a signed honesty statement to each submission limits the potential for academic misconduct and allows easy identification of misconduct should it occur. An example of this honesty statement is provided at the end of this document. (C.A. Britson, December 2018)

### Scientific Writing Assignment #1 (20 pts)

The appendix section of your lab manual, “Scientific Writing and Preparing a Scientific Research Paper for Peer Review”, includes background information for this series of assignments. In the first assignment you will be (1) identifying and selecting a peer-reviewed journal article for analysis and (2) preparing for, participating in, and successfully completing related in-class activities.

You may select any peer-reviewed journal article published in the past four months that reports on **original** scientific research involving some aspect of the nervous system. Review articles will not be accepted for this assignment. The university's library and website are good places to start searching for an article. [*Insert brief instructions for accessing your institution's library journals and databases.*] By entering this information you will have full access to any journal for which the library has a subscription.

You will need to include the following in your article analysis:

- 1) Complete and correct publication information for the article.
- 2) A copy of the complete article.
- 3) Attached and signed honesty statement.
- 4) The chapter and section from the lecture textbook (Sherwood) that is most applicable to the journal article. Include a short (1-2 sentences) description of why the chapter and section are applicable.
- 5) From the Introduction, list the authors' hypothesis and two main justifications for testing the hypothesis.
- 6) From the Materials and Methods section, list (a) the species of organisms tested including scientific names, (b) the number of organisms tested, (c) the experimental treatment factors, (d) the response variables measured, and (e) the analytical methods used to examine the data.
- 7) From the Results section, list three main findings from the experiment.
- 8) From the Discussion section, list the interpretation and significance of each of the three findings from the Results.

Your journal article analysis is **limited to one page** in length. You must also highlight (or underline) the sections from the journal article where you found the above information.

## Scientific Writing Assignment #2 (20 pts)

The appendix section of your lab manual, “Scientific Writing and Preparing a Scientific Research Paper for Peer Review”, constitutes the background information for this series of assignments. In the second assignment you will be examining the Instructions to Authors from a peer-reviewed journal.

You may select any peer-reviewed journal that reports on scientific research involving some aspect of physiology. You may use the instructions from the journal that published the article you reviewed for the first scientific writing assignment, but you are not required to do so. The university’s library and website are good places to start searching for a journal’s instructions to authors. [*Insert brief instructions for accessing your institution’s library journals and databases.*] By entering this information you will have full access to any journal for which the library has a subscription.

You will need to include the following in your Instructions to Authors analysis:

- 1) A printed copy of the Instructions to Authors.
- 2) Attached and signed honesty statement.
- 3) What is the name and scope of the journal? In regards to scope, what types of articles (i.e., experiments, study subjects, etc.) will it publish or refuse to publish? Keep in mind that this information can be found in more than one location in the Instructions to Authors.
- 4) What are the costs of submission and publication?
- 5) What are the policies on the use humans, animals, and fetal tissue in experimental research. You may identify the title and source of the policies rather than including the entire policy.
- 6) What is the journal’s policy on disclosing conflicts of interest, financial or otherwise, by the authors of submitted articles?
- 7) What is the journal’s policy on reporting statistical results?
- 8) What style of writing is followed by the journal (e.g., Council of Biology Editors, Chicago Manual of Style, APA format, etc.)
- 9) What is the format for the organization of sections within the manuscript?
- 10) What is the format for citing references *in the body of the manuscript*? In other words, does the journal use the Name-Year system or the Citation-Sequence system for in-text citations?
- 11) What is the format for listing a journal article, a chapter within a book, and digital article (available only through electronic means) *in the Literature Cited section*?

Your Instructions to Authors analysis is limited to one page in length. You must also highlight (or underline) the sections from the Instructions to Authors where you found the above information

### Scientific Writing Assignment #3 (20 pts)

The appendix section of your lab manual, “Scientific Writing and Preparing a Scientific Research Paper for Peer Review”, constitutes the background information for this series of assignments. In the third assignment you will be conducting a peer review of a scientific paper written by another undergraduate.

The journal *Bios* (<http://www.tri-beta.org/bios.html>) is published by the National Biological Honor Society for undergraduate students, Beta Beta Beta. It publishes research conducted and written by undergraduates working in all areas of biology. The university’s library and website are good places to start searching for an article from *Bios*. [Insert brief instructions for accessing your institution’s library journals and databases.] By entering this information you will have full access to *Bios*.

The *Journal of Young Investigators* is a web-based journal (<http://www.jyi.org/>) that publishes the work of undergraduates or recent graduates in several areas of science (biology, chemistry, physics, mathematics, etc.). All back issues are available online.

You will first need to select a research article (i.e., hypotheses have been tested) from *Bios* or *Journal of Young Investigators* addressing any area of physiology (broadly interpreted). You are limited to selecting articles published within the past ten years. Only submissions from these two journals will be accepted for grading.

Include the following when submitting your assignment:

- 1) A printed copy of the article.
- 2) Attached and signed honesty statement.
- 3) A completed peer review form.
  - a. Include the article title and date of your review on the peer review form.
  - b. For each of the following items provide a ranked level of quality (from 1 to 5 with 5 being highest quality) and your reasons (2-3 sentences) for assigning that ranking.
    - i. Title: The title is informative and engaging.
    - ii. Abstract: The Abstract succinctly summarizes the hypotheses, justification, pertinent methods, major findings, and principal conclusions in 250-300 words.
    - iii. Introduction: The Introduction provides a thorough background for the importance of the topic, identifies limitations and unknown information in the background literature, and states the hypotheses and purpose of the present research.
    - iv. Materials and Methods: The authors provide sufficient detail that a reader could replicate the experiment. The research organism is identified (to species and strain if possible), all experimental protocols and resources are identified, safety and ethical protocols have been approved and identified, and statistical analyses have been described.
    - v. Results: The authors present the main findings of their research without discussing or interpreting the findings. Statistical results including reporting of exact p-values and parameters of variation (e.g., standard deviation). All tables and figures are necessary, correctly formatted, and provide enough information to stand alone from the body of the manuscript.
    - vi. Discussion: The authors interpret the results of their research and their results support or refute the published results of other scientists. The authors present hypotheses for future study.
    - vii. Literature Cited: All articles cited in the body of the manuscript are listed in the Literature Cited section and vice versa.
    - viii. Conclude your review by providing a 1 paragraph summary of your overall review, suggested improvements, and summed ranked score.

**Expect to write one full page, and a maximum of two, for your review.**

Remember, publication of an article doesn’t automatically mean that the article is perfect!

## Scientific Writing Assignment #1 (20 pts)

You will need to include the following in your article analysis:

- 1) \_\_\_\_\_ 1 pts Complete and correct publication information for the article.
- 2) \_\_\_\_\_ 1 pts A copy of the complete article.
- 3) \_\_\_\_\_ 1 pts Attached and signed honesty statement.
- 4) \_\_\_\_\_ 1 pts The chapter and section from the lecture textbook (Sherwood) that is most applicable to the journal article. Include a short (1-2 sentences) description of why the chapter and section are applicable.
- 5) \_\_\_\_\_ 4 pts From the Introduction, list the authors' hypothesis and two main justifications for testing the hypothesis.
- 6) \_\_\_\_\_ 4 pts From the Materials and Methods section, list (a) the species of organisms tested including scientific names, (b) the number of organisms tested, (c) the experimental treatment factors, (d) the response variables measured, and (e) the analytical methods used to examine the data.
- 7) \_\_\_\_\_ 4 pts From the Results section, list three main findings from the experiment.
- 8) \_\_\_\_\_ 4 pts From the Discussion section, list the interpretation and significance of each of the three findings from the Results.

Your journal article analysis is limited to one page in length. You must also highlight (or underline) the sections from the journal article where you found the above information.

## Scientific Writing Assignment #2 (20 pts)

You will need to include the following in your Instructions to Authors analysis:

- 1) \_\_\_\_\_ 0.5 pts A printed copy of the Instructions to Authors.
- 2) \_\_\_\_\_ 0.5 pts Attached and signed honesty statement.
- 3) \_\_\_\_\_ 3 pts What is the name and scope of the journal? In regards to scope, what types of articles (i.e., experiments, study subjects, etc.) will it publish or refuse to publish? Keep in mind that this information can be found in more than one location in the Instructions to Authors.
- 4) \_\_\_\_\_ 2 pts What are the costs of submission and publication?
- 5) \_\_\_\_\_ 3 pts What are the policies on the use humans, animals, and fetal tissue in experimental research. You may identify the title and source of the policies rather than including the entire policy.
- 6) \_\_\_\_\_ 2 pts What is the journal's policy on disclosing conflicts of interest, financial or otherwise, by the authors of submitted articles?
- 7) \_\_\_\_\_ 1 pts What is the journal's policy on reporting statistical results?
- 8) \_\_\_\_\_ 2 pts What style of writing is followed by the journal (e.g., Chicago Manual of Style, APA format, etc.)
- 9) \_\_\_\_\_ 2 pts What is the format for the organization of sections within the manuscript?
- 10) \_\_\_\_\_ 2 pts What is the format for citing references *in the body of the manuscript*? In other words, does the journal use the Name-Year system or the Citation-Sequence system for in-text citations?
- 11) \_\_\_\_\_ 3 pts What is the format for listing a journal article, a chapter within a book, and digital article (available only through electronic means) *in the Literature Cited section*?

Your Instructions to Authors analysis is limited to one page in length. You must also highlight (or underline) the sections from the Instructions to Authors where you found the above information.

### Scientific Writing Assignment #3 (20 pts)

You will need to include the following in your Instructions to Authors analysis:

- 1) \_\_\_\_\_ 0.5 pts A printed copy of the reviewed article. Article must be from Bios or JYI and published within the past ten years.
- 2) \_\_\_\_\_ 0.5 pts Attached and signed honesty statement.
- 3) \_\_\_\_\_ 1 pts Peer-review form with review initials and title entered.
- 4) \_\_\_\_\_ 1 pts Score and comments on Title.
- 5) \_\_\_\_\_ 2 pts Score and comments on Abstract.
- 6) \_\_\_\_\_ 2 pts Score and comments on Introduction.
- 7) \_\_\_\_\_ 2 pts Score and comments on Materials and Methods.
- 8) \_\_\_\_\_ 2 pts Score and comments on Results.
- 9) \_\_\_\_\_ 3 pts Score and comments on Discussion.
- 10) \_\_\_\_\_ 1 pts Score and comments on Literature Cited.
- 11) \_\_\_\_\_ 2 pts Score and comments on Overall Presentation.
- 12) \_\_\_\_\_ 3 pts Additional Comments for Improving the Manuscript.

## **Honesty Statement**

With my signature below I confirm that I have completed this assignment by my own efforts. All word from outside sources have been cited using correct scientific notation. All other words, diagrams, and/or calculations are my own.

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Name

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Date