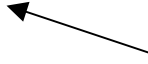


# Writing a scientific paper

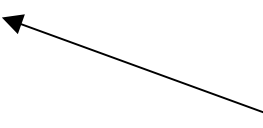
Title



By  
(optional)

Amy Nunnally

Author

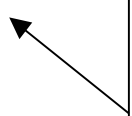


University of Colorado, Boulder

Immunology, MCDB 0000, Saturday 8 – 11pm

TA: John Johnson

Name of Institution  
Course Name and  
Number  
Section #  
TA Name



***Note: Please reference the document “Notes on Reporting” for detailed information on writing figure legends, abstracts, formulating hypotheses, etc.***

### Abstract

The Abstract is a separate 1/2 - 3/4 page summary of the work you have done. It cannot be any longer. This section is meant to quickly give the reader the main ideas of your paper. It *should not* contain the details of your experiment, but rather a few sentences of background information, your goals/hypotheses, and a brief description of your results. Any information included in this section must also be included in the body of your paper. The abstract, like the rest of the paper, should be double-spaced.

### Introduction

The Introduction is the beginning of your paper. This section includes background information on your organism/study and previous experimental results that have preceded your experiment. When presented properly, this section ensures that the reader will be able to understand the details of your experiment as well as its relevance to the scientific community. A clear and concise statement of the purpose of your study, your hypothesis, and predictions should be included in the introduction

Extraneous information that is not *directly* related to your experiment or the understanding of your experiment should not be included. ***All of the information included in this section must be referenced.*** Sources are referenced within the text in this way (Nunnally, 1999), (Nunnally and Smith, 1999) for only two authors, or (Nunnally et al., 1999) for more than two authors.

### Materials and Methods

The Materials and Methods section of your paper should be very detailed, but concise. *If published protocols are being used, cite those sources and list in detail any alterations that you made to the protocol. If you have created your own protocol, you must describe it in complete detail.* The reader must be able to replicate your experiment solely with the information contained within this section. This section will contain the names of all reagents, their concentrations and pH, specific volumes used, and the lengths of times for all incubations. If multiple experiments were performed, they may be separated with sub-headings and described individually. It is vital in the material and methods that the reader understands your experimental design and how data will be analyzed. This section, like the rest of the paper, must be in paragraph form. Long sentences should be avoided. *Do not* use outline form or bullets.

### Results

The Results section should also be very concise and in **paragraph form** that includes the exact results of your experiment. The data must be described in words and may be accompanied by figures and tables. However, figures and tables alone are not appropriate and cannot replace the written text of this section. References to figures or tables are included within the text in this way (Figure 1) or (Table 1). For a lab report, it is best to include figures and tables in the body of your results section. For publication purposes, figures and tables are normally placed after the body of the paper, following the References Section. Do not include any procedural information, conclusions, or interpretations in this section, only data.

### Discussion

All conclusions that you draw from your experiment should be included here. This is where you *interpret* your results for the reader. Describe in detail what you observed and explain why. What molecular mechanisms or biological properties were acting to bring about these results? Did your results support your hypotheses? Why or why not? (Statistical analyses should be included here. If no statistical analysis is available, you must critically analyze your data in this section.) Current research should also be included in this section. What does current research say about similar experiments? Does current research add credibility to your results? If yes or no, why? Also, did anything go wrong during your experiment? What might have been done to improve your experiment? What experiments might you perform in the future to further elucidate your results? After studying your results, what questions might you ask next?

### Acknowledgements (optional)

This small section should be included as the last section of text. It will only be a few sentences, but it is important to recognize those people who helped you formulate and complete your experiments.

### References

The References page should begin as a new page. It should also be numbered. Below is an example of the format. There are slight variations on this format that are acceptable (see papers in Cell, Development, Genetics, etc. for different formats), but it is easiest to follow the format below. Initials are used for all first and middle names. The year of publication is in parentheses. The journal name is spelled out. The volume number is in boldface type followed by a comma and the page numbers of the article cited. Each citation ends with a period. For books, the city of publication and the publisher must be included.

**Brown, J.R. and Doolittle, W.F.** (1997) *Microbiology and Molecular Biology Review* **61**, 456-502.

**Hogan, B., Beddington, R., Costantinim, F. and Lacy, E.** (1994). *Manipulating the Mouse Embryo: A Laboratory Manual*. New York: Cold Spring Harbor.

**Molitor, M., Dahl, C., Molitor, I., Schafer, U., Speich, N., Huber, R., Deutzmann, R. and Truper, H.G.** (1998) *Microbiology* **144**, 529-541.

Name (optional) 5

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