Scientific Research Reports and Proposals: What Goes Where

Research Reports

Abstract

This is a one-paragraph version of your paper, which includes

- one to two sentences of background information,
- your question or hypothesis,
- three to six sentences of methods and results,
- and your conclusion (and optionally, implications).

Introduction

- Explain why you did the work in the paper.
    - Describe how the work relates to a clinical problem or basic issue of broad interest.
    - Include only the background necessary to explain this relationship.
- At the end, state the question addressed by your report.

Methods

Explain how you did the study.

- Provide sufficient detail for other researchers to replicate your work.
    - Did you follow other researchers' methods exactly? Give the reference only.
    - Did you modify other researchers' methods? Give the reference and note the changes.
- If you are doing one big experiment, include an experimental design section at the beginning of the methods section.

Results

The results section reports what you observed.

- If you did one big experiment, describe the observations in order of importance.
- If you did many experiments, remember that one determines the next.
    - If you did many experiments, you may include a reference to the method for each (no more detail than necessary to understand result).
    - Explain the background at the beginning (if necessary) and conclusion of each experiment to provide rationale for the next experiment.

Discussion

The discussion section explains what your results mean for the field.

- Start with the major conclusion(s); this should clearly correspond to the research question addressed in your introduction.
- You *may* include any of the following:
    - defense of the conclusions,
    - explanation of unexpected results,
    - importance and novelty of the results,
    - implications for future research or disease therapy,
    - or speculation (what the results may mean about the thing studied).

Proposals

Abstract

This is a one-paragraph version of your proposal, which includes

- one to two sentences of background,
- your hypothesis,
- and your specific aims and corresponding experiments.

Specific aims (approximately one page)

State the purpose of the proposed research by describing

- a problem or unknown,
- a hypothesis (and optional brief rationale),
- a broad description of your approach,
- and two to four independent goals/questions (one sentence each).

Background and significance (approximately two pages)

This section should

- explain how the proposed research will address an important problem,
- convince committee members or reviewers that you understand the field and that the proposed research is innovative, and
- provide rationale for your hypotheses (you might also explain or defend your choice of experimental approach).

Preliminary data

Preliminary data provides experimental support for your hypotheses and proposed methods.
For each experiment, explain:

- why and how it was performed,
- what was observed, and what the results mean.

Research design and methods

Describe how the project will be carried out.

- For each aim, describe the set of experiments (and their controls) that you will use to test the corresponding hypothesis.
- For each experiment, identify outcomes that would confirm the hypothesis and potential problems and how they will be addressed.