

Guidelines for the Research Proposal

Chem396 Fall 2017

Proposals are informative and persuasive writing because they attempt to educate the reader and to convince that reader to do something (give you money). The goal of the writer is not only to persuade the reader to do what is being requested, but also to make the reader believe that the solution is practical and appropriate. In persuasive proposal writing, the case is built by the demonstration of logic and reason in the approach taken in the solution. The effectiveness of your proposal will depend on your ability to explain the nature, context and scope of your project.

Part I: Cover Sheet.

A. Name of Students in research team

B. Proposal Title Make your title as specific as possible. It should not only indicate goals of the research, but it should also convey the types of experiments used.

Part II. Introduction (ca. 2 pages).

- A. General Introduction.** Describe the general area of research that you intend to pursue. Define any unusual or specialized terms. Explain the significance of the problem, and the impact to society of pursuing this area of research. Note any areas that raise potential ethical issues.
- B. Goal(s) Statement.** Provide a 1-2 sentence statement explaining the overall goals of your proposed research. What is the best probable outcome of your proposed studies? This statement should be a separate paragraph that is underlined or otherwise distinguished from the other text. Some good ways to formulate the statement would be: "Successful completion of the proposed research will provide a new method for the analysis of complex protein samples." OR "If successful the proposed experiments will result in a more detailed understanding of the mechanism of pyruvate dehydrogenase."
- C. Background.** Give a more focused introduction to the specific experiments in your proposal. Discuss the recent work that leads up to your proposed investigations. Describe any unusual or specialized techniques that you will apply to the problem. It is important to clearly identify the differences between your proposal and what has been done previously or in competing labs. What questions are left unanswered by the earlier studies? What limitations exist in earlier or competing methods that will be addressed by your studies?

Part III: Proposed Research. (ca. 3 pages).

In the third part of the proposal you will discuss your planned experiments (or theoretical investigations). This is where you will flesh out your Objectives and Tasks. Describe your initial experiments in detail. How will you obtain your materials? What measurements will be made? Discuss the possible outcomes of these experiments and what you will conclude given the various possible outcomes. Outline how you will use these results to plan subsequent experiments (e.g. "...if this fails to provide the monoclonal antibody, then the following alternative strategies will be examined.") It is often a good idea to provide some sort of timetable or other indication of what experiments are going to be done first and which ones will be done later. Make sure there is a clear connection between your results and your specific aims. Where possible you should justify the feasibility of key steps by citing related work in the literature.

Note the page counts are just guidelines. **The main body of the proposal (Parts II and III) is limited to 5000 words of text.** This corresponds to about 5 pages of single spaced 12-point Times New Roman text, using 1-inch margins on top, bottom, and sides. Use the word count utility on your word processor to see how close you are to the limit. There is no limit to the number or size of figures and/or equations in the main body. Also, the cover page, references, and appendices are not counted toward the word limit.

Part IV: References.

Provide a complete reference list using a standard format. For example,

Mirica, K. A.; Phillips, S. T.; Shevkoplyas, S. S.; Whitesides, G. M. *J. Am. Chem. Soc.* **2008**, *130*, 17678-17680. "Using Magnetic Levitation to Distinguish Atomic-Level Differences in Chemical Composition of Polymers, and to Monitor Chemical Reactions on Solid Supports."

You can cite as many references as you want.

Goals vs Objectives vs Tasks

The words Goal and Objective are often confused with each other. They both describe things that a person may want to achieve or attain but in relative terms may mean different things. Both are desired outcomes of work done by a person but what sets them apart is the time frame, attributes they're set for and the effect they inflict. Both the terms imply the target that one's efforts is desired to accomplish.

Goals are generically for an achievement or accomplishment for which certain efforts are put. Goals are the vision of the project.

Objectives are specifically for targets within the general goal. Objectives are time related to achieve a certain task. Objectives are measurable activities to achieve goals – the end points envisioned for the proposed project. These objectives might be, for example, development of a specified measurement capability that meets a prescribed accuracy, data rate, instrument packaging characteristics (size, weight, etc.), and other possible requirements. Analogies would be the goal line in a football game, and the mountain peak a climber plans to ascend. Objectives are achieved, or they are not. They are not performed or carried out. They do not yield results or data.

Tasks in a work (or research) plan are steps taken to achieve the stated objectives for the project. They are, for example, a sequence of experiments, analyses, field trials, etc., that together lead to attainment of the project objectives. In the football game analogy, the tasks are a sequence of plays that culminate in getting the ball over the goal ("objective") line. To the mountain climber, the tasks are a series of actions (hiking up trails, crossing streams, climbing rocks, etc.) that bring the climber to the targeted mountain peak.

	Goal	Objective
Meaning	The purpose toward which an endeavor is directed.	Something that one's efforts or actions are intended to attain or accomplish; purpose; target.
Time frame	Long term	Short term
Measure	Cannot be measured	Can be measured
Example	I want to achieve success in the field of genetic research and do what no one has ever done.	I want to give you the thesis on genetic research within this month.
Type	Intangible	Tangible
Action	Generic action	Specific action
Plan	Broad plan	Narrow plan