

*General sections for proposal preparation
(Mostly taken from NSF proposal guidelines
Also Susan Finger, UCM)*

Project Summary - Resumen Ejecutivo

(Note that this is usually the last piece you write in the proposal)

The Project Summary should be written in the third person, informative to other persons working in the same or related fields, and, insofar as possible, understandable to a scientifically or technically literate lay reader. *It should not be an abstract of the proposal.*

Sections:

Overview

Intellectual Merit

Broader Impacts

The **overview** includes a description of the activity that would result if the proposal were funded and a statement of objectives and methods to be employed.

The statement on **intellectual merit** should describe the potential of the proposed activity to advance knowledge.

The statement on **broader impacts** should describe the potential of the proposed activity to benefit society and contribute to the achievement of specific, desired societal outcomes.

Project Description

The Project Description should provide a clear statement of the work to be undertaken and must include: objectives for the period of the proposed work and expected significance; and relation to the present state of knowledge in the field and to work in progress elsewhere.

The Project Description should outline the general plan of work, including the broad design of activities to be undertaken, and, where appropriate, provide a clear description of experimental methods and procedures.

Proposers should address what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified. These issues apply to both the technical aspects of the proposal and the way in which the project may make broader contributions.

Possible Sections:

Introduction and Background

Basic General Questions and theoretical Background

Science Objectives

Key Questions

How to address the key questions

Proposed Research

Plan of Work (Timeline?)

Budget

The **Introduction and Background** is a key aspect of the proposal. Surprisingly, this section can kill a proposal. You need to be able to put your work in context. Often, a proposal will appear naive because the relevant literature is not cited. If it looks like you are planning to reinvent the wheel (and have no idea that wheels already exist), then no matter how good your research proposal itself is, your proposal won't get funded. If you trash everyone else in your research field, saying their work is no good, you also will not get funded. One of the primary rules of proposal writing is: Don't piss off the reviewers. You can build your credentials in this section by summarizing other people's work clearly and concisely and by stating how your work uses their ideas and how it differs from theirs.

- What longterm technical goals will this work serve?
- What are the main barriers to progress? What has led to success so far and what limitations remain?
- What is the missing knowledge?
- What aspects of the current state-of-the-art lead to this proposal? Why are these the right issues to be addressing now?
- What lessons from past and current research motivate your work? What value will your research provide? What is it that your results will make possible?
- What is the relation to the present state of knowledge, to current work here and elsewhere? Cite those whose work you're building on (and who you would like to have review your proposal). Don't insult anyone. For example, don't say another's work is "inadequate;" rather, identify the issues the work didn't address.

Science Objectives is the section where you try to state exactly what the main scientific challenges are. Emphasize what the new ideas are. Briefly describe the project's major goals and their impact on the state of the art. Give the reviewer the context for the proposal.

Clearly state the key scientific questions you will address:

- Why is it important? What makes something important varies with the field. For some fields, the intellectual challenge should be emphasized, for others the

- practical applications should be emphasized.
- Why is it an interesting/difficult/challenging question? It must be neither trivial nor impossible.

One major component here is how you are going to **address the key questions**, which comes back to a good technical description of the methods to be used. It could be simply be called a **methodology** section, but it really depends on how you write the proposal.

This section should include a technical description of your methods you want to use, including the activities, methods, data, and theory. Write to convince the best person in your field that your idea is good and the approach you will take is appropriate. Simultaneously, you must convince someone who is very smart but has no background in your subarea.

Finally, you can write a **Proposed Research** section, which now explains what you are planning to do. This is the part that counts. **WHAT** will you do? Why is your strategy an appropriate one to pursue? What is the key idea that makes it possible for to answer this question? **HOW** will you achieve your goals? Concisely and coherently, this section should complete the arguments developed earlier and present your initial pass on how to solve the problems posed. Avoid repetitions and digressions.

The question is: What will we know when you're done that we don't know now? The question is not: What will we have that we don't have now? That is, rather than saying that you will develop a system that will do X, Y and Z, instead say why it is important to be able to do X, Y and Z; why X, Y and Z can't be done now; what knowledge is needed to make X, Y, and Z possible, your plan that will make it possible to do X, Y and Z; and, by the way, you will demonstrate X, Y and Z in a system.

Present a **Plan of work**, for how you will go about addressing/attacking/solving the questions you have raised. Discuss expected results and your plan for evaluating the results. How will you measure progress? Include a discussion of milestones and expected dates of completion.

You are not committed to following this plan but you must present a **FEASIBLE** plan to convince the reviewers that you know how to go about getting research results.

In some cases, this is often the hardest section to write. You don't have to write the plan that you will follow no matter what. Think of it instead as presenting a possible path from where you are now to where you want to be at the end of the research. Give as much detail as you can.