

# Bioinformatics and Bioengineering Summer Institute

## How to Write a BBSI Research Proposal

### I. Audience

The proposal should be directed to an audience consisting of your peers. Explain what is necessary so that every one of you will understand the proposal. No need to explain what is common knowledge for all.

### II. Format

The format below is one that will get the job done. If you believe your proposal calls for a format that accomplishes the same ends but in a different *and better* way, fine. Then use your own format. It's always OK to add quality.

#### II.A. Introduction

The purpose of this section is to engage a general audience and to bring that audience to the specific question you intend to address. This question should be the climax of the section, and it should feel like a climax.

An Introduction should not threaten the reader. Begin with a general question that is well within the grasp of anyone in your intended audience. The Introduction should feel like a logical journey from the general question to your experiment.

Proceed from your general question in logical steps towards the experiment. Explain what is necessary for us to understand each step, particularly previous results that led to the asking of the question. Don't explain what we don't need to understand, even if the topic is important in many other contexts.

Try to craft the Introduction so that the question you ultimately ask seems inevitable. Let the question spring to our minds, even as you ask it yourself.

#### II.B. Methods

Present the strategy you will use to answer the question posed in the Introduction. It is not necessary to give the experimental details, by which I mean things like recipes for growth media or how long you centrifuge some cells, but you should explain the experiments so that we can understand the experimental conditions and the principles underlying all pertinent methods. If your project is not experimental in nature (e.g. writing a program), then consider providing an outline of the program as you envision it and explanations of the pertinent algorithms.

#### II.C. Possible results and their implications

Describe what results (good and bad) might result from the proposed experiments (or program) and how they might address both the experimental and general questions you raised in the Introduction. Discuss pitfalls you might encounter and how you might address them. Finally, address the issue of time: how long might this project take. This is obviously not an easy question for you to answer, but go as far as you can in consultation with your advisor, so that (to the extent possible) you will not be surprised by a project that cannot be completed.

#### **II.D. References**

It goes without saying that you will refer to the results of others, both in justifying the question you're asking and the methods you're using. This proposal is not an exhaustive review of the field, however. Give those key references that would help the interested reader learn more. References may be in any format, so long as the following information is provided: (for journal articles) Authors, year, title, journal citation (volume and inclusive pages); (for chapters in books) Authors, year, title of chapter, title of book, editors, publisher, city, and inclusive pages; (for books) Authors, year, title, publisher, and city.

#### **III. Length of proposal**

The whole thing might run 2 to 3 pages, not counting references. The project may be limited by what can be accomplished in one summer or you might set your sights for the full 15-month period. I suggest the former course unless circumstances dictate otherwise.

#### **IV. How to submit the proposal**

Convert the file to PDF or HTML and put it on your web page.