BNFO 301: Introduction to Bioinformatics
How to Write a Research Summary

I. Audience

The proposal should be directed to an audience consisting of someone much like yourself who will be continuing your project. Presume that this person has no knowledge of BioBIKE or of your project. Explain what is necessary so that your audience will understand the *motivation*, the *core question*, the *methods*, and the *results* of your project. By the end, your audience should be able to take up where you left off and continue your project to achieve even greater ends.

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. Along that journey, you will no doubt mention previous work by others that have led to the question you ask. You might show diagrams or other visual aids if appropriate. You should definitely cite the relevant work.

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. The question should be answerable by what you did in your project. The question you ask should be obvious even to the most inattentive readers. One way to emphasize the question is to place it in a position of power – no doubt the last paragraph of the Introduction, possibly the last sentence.

II.B. Methods

Present the strategy you used to address the core question. This section differs from what you may be familiar with from research papers in that you should go to greater lengths to be helpful to your audience. Warn against pitfalls you encountered. Definitely give the actual code you used (perhaps as an appendix), and explain to a nonprogrammer what it does. The reader should come away with a sense that he/she could do what you did.

II.C. <u>Results and their implications</u>

It is important to write this section as a narrative. Don't merely throw your results in like slopping mashed potatoes on a plate. Refer frequently to the core question. You might say things like: *In order to answer such-and-such question, I did this, and got the following result (Figure X). You will notice that such-and-such occurred, as expected, but thus-and-so was a surprise, since .... I therefore tried....* It may be useful to put raw results in an appendix and massaged results that can be readily understood as a figure or table in the Results section.

II.D. <u>Discussion</u>

Discuss the degree to which your question has been answered. What remains to be done. Do you have suggestions for those who will continue your work?

II.E. <u>References</u>

It goes without saying that you will refer to the results of others, in justifying the question you're asking and setting the context for the results you obtained. 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

It is difficult to predict how long the proposal might be as different people will have different circumstances.

IV. What to do with the final project

Send me the file ***making sure that your name is in the file name somewhere***. At the same time, send the file to your research collaborator.