

# Structure of the Proposal

# Project Summary

- This is no more than 1 page in length.
- The summary should start with a statement setting up the context for your proposed project.
- This should be followed by a description of what you will do in the project.
- Finally, the summary should tell the reader why your project is important.
- Many reviewers on the panel will not read the proposal, but will read or skim the Summary. It is crucial that this be well-written.

# Proposal Body

- 15 pages long
- **Statement of Specific Aims**
- Background and Significance
- Research Plan

# Statement of Specific Aims

- The most important part of the proposal. Reviewers will refer to this section during the panel discussion of the proposal.
- A typical proposal has 3-4 aims.
- An aim should be a brief statement of an achievable goal.
- Each aim should be well thought out. If even one aim is uninteresting or (worse) not doable, then the proposal will probably not be funded.
- Most successful grant writers spend months coming up with good specific aims.

# Good or Bad?

- **Aim 1: Develop a model of the pancreatic beta-cell.** We will use recent experimental data to produce a mathematical model of the beta-cell.

Good or Bad?

BAD!!!

## Good or Bad?

- **Aim 1: Develop an improved model of the pancreatic beta-cell.** Previous beta-cell models were based on electrical and calcium data from relatively early experiments. Recent experimental progress has produced new data on electrical and calcium measurements, as well as on beta-cell metabolism. We will use this data to build an improved beta-cell model.

Good or Bad?

Good!!!!!!

# Good or Bad?

- **Aim 1: Develop an improved model of the pancreatic beta-cell.** Previous beta-cell models were based on electrical and calcium data from relatively early experiments. Recent experimental progress has produced new data on electrical and calcium measurements, as well as on beta-cell metabolism. We will use this data to build an improved beta-cell model. In particular, we will include differential equations for variables such as the glycolytic intermediates fructose 6-phosphate and fructose biphosphate, as well as equations for mitochondrial variables such as the inner membrane potential, mitochondrial calcium, and oxygen concentration.

Good or Bad?

BAD!!!

## Good or Bad?

- **Correct a recent model of the pancreatic beta-cell.** A recent mathematical model of the beta-cell neglected the influence of the endoplasmic reticulum (ER). We will correct this deficiency by incorporating the ER into the beta-cell model, thus generating an improved model.

Good or Bad?

**BAD!!!**

## Good or Bad?

- **Incorporate the filtering properties of the endoplasmic reticulum into a recent model of the pancreatic beta-cell.** A recent mathematical model of the beta-cell neglected the influence of the endoplasmic reticulum (ER). The ER has been shown to play a key role in cellular calcium dynamics, and to act as a calcium filter. We will incorporate the filtering properties of the ER into a recent beta-cell model, improving the predictive power of the model.

Good or Bad?

Good!!!!!!

## Good or Bad?

- **Develop a mathematical model of type II diabetes.** Diabetes is a disease that affects millions of people throughout the world. It is due to defects in pancreatic beta-cells, the liver, or both. We will develop a mathematical model that describes type II diabetes.

Good or Bad?

BAD!!!

# Proposal Body

- 15 pages long
- Statement of Specific Aims
- **Background and Significance**
- Research Plan

# Background and Significance

In this section you should set the context for your project.

How does the project fit into work that has been done in the field? Why are you doing it?

This is also a good place to discuss some basic concepts, definitions, biology, etc. that you will need in the next section of the proposal.

This is also a good section to discuss some of your prior work. If you have been funded by NSF recently, then you are required to have a subsection on **Results from Prior NSF Support.**

# Proposal Body

- 15 pages long
- Statement of Specific Aims
- Background and Significance
- **Methods and Preliminary Studies**

# Research Plan

This should be at least half of the proposal.

There should be a section for each aim. You should restate the aim, and then describe preliminary work that you have done that is relevant to the aim. Then you should describe how you will proceed to achieve the aim.

Stay on point. In the section on Aim 1 don't talk about Aim 2.

If you have Co-PIs or collaborators, then include a subsection describing how you will interact. What will each person do?