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# Day 2 - The Proposal Pre-Mortem: Responding to Reviewer Comments Before You Get Them

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# How to get NSF funding: Proposal Pre-Mortem

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# NSF Organizational Structure

- Discipline-based Directorates (7)
  - Biological Sciences
  - Computer & Information Sciences & Engineering
  - Education & Human Resources
  - Engineering
  - Geosciences
  - Mathematical & Physical Sciences
  - Social, Behavioral & Economic Sciences

# NSF Organizational Structure

- Divisions within each Directorate
    - Sections
    - Programs within Sections
    - Program Directors (permanent & IPAs)

# Proposal Preparation

- **NSF Resources**
  - Grant Proposal Guide (GPG) www.nsf.gov/pubsys/ods/getpub.cfm?gpg
  - NSF publication on broader impacts http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf
  - NSF Home Page -- Guide to Programs Program
  - Announcements – eligibility, goals, special requirements

# Types of NSF proposals

- Program Solicitations/Announcements

- Cross-Directorate Programs (CAREER)

-  Unsolicited proposals

-  SGERs (small Grants for Exploratory Research; <200,000 for 2 years)

- Supplements (including REU, RET)

# Review Process Overview

- Four possible layers of review
- Two distinct audiences – technical and general

**YOU**

**PROGRAM DIRECTOR**

**REVIEWERS (3 to 6)**

**PANEL**

**$$$$**

# General characteristics of people making decisions on your proposal

- **PROGRAM DIRECTOR**
  - **Busy/Generalist in the field**
  - **Looks at all proposals**
  - **Runs Panel/Merit Review**
  - **Helpful, can be cranky**

# General characteristics of people making decisions on your proposal

- **REVIEWER**
  - **Technical/Specialist in the field**
  - **Very busy**
  - **Reads one proposal in detail**
  - **Helpful, can be grumpy**
  - **Wants to do anything else**

# General characteristics of people making decisions on your proposal

- **PANELIST**
  - **Broad expertise**
  - **Very, very busy**
  - **Reads many proposals  (~50)**
  - **Compares and ranks proposals**
  - **Wants to be done**

# Who Gets Funded

- **EXCELLENT – Almost always FUNDED**

- **VERY GOOD/EXCELLENT**

    **– Typically FUNDED**

- **VERY GOOD – Grey Zone**

- **VERY GOOD/GOOD/FAIR/POOR**

    **– Almost NEVER FUNDED**

# Common Reasons for High Ratings

- "This proposal suggests a clear, elegant, well-documented approach to a problem that has plagued this field for decades."

- "The PI has a beautiful plan. Undergraduates or new graduate students can step right into this work, yet it solves a major problem and will be publishable in a first-rate journal."

# Common Reasons for High Ratings

- "This is certainly adventurous, and I frankly would have doubted it could be done. Yet, the PI has proven the method in preliminary work AND had it accepted by a peer-reviewed journal!"

- "This reads like a dream. I have rarely seen a proposal, even from long-established investigators, that shows such careful thought and meticulous presentation."

# Common Reasons for Low Ratings

- <u>No well defined hypotheses or tests. Lack of focus</u>. "Why all the rambling, this seems like a fishing expedition."

- <u>Extraneous aspects or PIs</u>. "What does that component/co-PI have to do with the central focus of the proposal?"

# Common Reasons for Low Ratings

- Important information on experimental and sampling procedures is omitted. "I really can't tell what is going to be done and how."

- The work can be carried out, but it doesn't address any topic of broad current interest. "I would probably not read a paper describing the results."

# Common Reasons for Low Ratings

- Scope of the work is out of proportion to the budget and amount of time needed to do the work.

# How to Interpret a Review

Everyone Gets Bad Reviews! Why?

1. Flaw in idea, logic, or approach

2. Written in a way that allows criticism

3. Reviewer is wrong (if a reason is noted by more than one reviewer, you've got a problem)

# How to Interpret a Review

Strategy. WHAT to do?

1. Read review
2. Blow off steam (in private, not to the program director)
3. Think about what the reviewer is REALLY saying
4. Read again, annotate trouble spots in proposal
5. Now read the proposal pretending this is someone else's proposal

# What makes a proposal competitive?

1. Original ideas
2. Succinct, focused project plan
3. Cost effective
4. Knowledge and experience in the discipline
5. Realistic amount of work
6. Sufficient detail
7. Strong rationale or evidence of potential effectiveness

# Tips for Writing Competitive Proposals

1. Discuss size and scope of intellectual payoff
2. Use plain, simple English
3. Let no question fester
4. Do not include extra stuff
5. Put specifics in the Methods section
6. Use tables, figures, and flow charts to save words
7. Make it visually appealing (i.e. do not make reviewers curse you for making their job harder)
8. Include sufficient budget justification
9. Think of your proposal as the 40th in a stack

# Preparing the Proposal

1. Start Early (3-6 months before deadline)!
2. Review NSF Award Abstracts (Fastlane)
3. Talk to your NSF Program Director •
4. Talk to your colleagues; have experienced colleagues review a draft and comment
5. Recruit and describe university infrastructure support for your proposed project
6. Address the merit review criteria
7. Compliance checks (GPG)

# Give careful consideration

1. Two NSF Merit Review Criteria

2. Integration of Research and Education

3. Integration of Diversity into projects and activities

4. Additional program-specific Review Criteria (listed in the program announcement)

5. Suggest reviewers

# General NSF Review Criteria

❏ What is the intellectual merit of the proposed activity?

❏ What are the broader impacts of the proposed activity?

❏ Additional criteria may be listed in the solicitation/announcement of opportunity

# Intellectual Merit – 5 strands

❑ How important is the proposed activity to **advancing knowledge and understanding** within its own field or across different fields?

❑ How **well qualified** is the proposer to conduct the project?

❑ To what extent does the proposed activity explore **creative and original concepts** ?

# Intellectual Merit – 5 strands

❑ How **well conceived and organized** is the proposed activity?

❑ Is there sufficient **access to necessary resources**?

# NSF Broader Impacts activities – 5 strands

❑ How well does the activity advance discovery and understanding while **promoting teaching, training and learning**?

❑ How well does the proposed activity **broaden the participation of underrepresented groups** ?

# NSF Broader Impacts activities – 5 strands

❑ To what extent will it **enhance the infrastructure for research and education**, such as facilities, instrumentation, networks and partnerships?

❑ Will the results be **disseminated broadly to enhance scientific and technological understanding**?

❑ What may be the **benefits** of the proposed activity **to society**?

# Broader Impacts activities…..

❖ Justify your reason for getting the money

❖ Address the funding agency's mission

❖ Tell Congress and the general public why they should care

❖ Allow programs to pick your proposal over others

Examples and further information provided at:
http://www.nsf.gov/pubs/2002/nsf022/biexamples.pdf

# How to integrate research and education?

- ❖ Build these efforts into your research plan (Broader Impacts criterion)

- ❖ Target specific NSF programs in your discipline and in Education and Human Resources (EHR)

  - ❖ Division of Undergraduate Education (DUE, eg CCLI)

  - ❖ Division of Graduate Education (DGE)

  - ❖ Division of Elementary, Secondary and Informal Science Education (ESIE)

# Support in proposal preparation

o  Talk to NSF Program Officers

o  Serve as reviewer and panelist

o  Review funded proposals

o  Seek mentors on campus

o  Use your Sponsored Research Office

o  NSF Publications

  o  Program Announcements

  o  Grant Proposal Guide

  o  Web Pages

  o  Funded Project Abstracts

  o  Reports, Special Publications