A BEGINNERS GUIDE TO GRANT WRITING AND REVIEW

Slides contributed by:
Nancy Desmond (NIMH)
Margaret Jacobs (NINDS)
Richard Ikeda (NIGMS)
Luis Santana (Univ. Washington)
Enhancing Your Chances

- Talk to NIH: Look through the NIH web site to identify appropriate Institutes. Call the Program Directors at the Institutes to discuss your idea.
- Make sure your application is assigned to the correct Study Section. Discuss potential Study Sections with both Program Directors and Scientific Review Administrators.
- Craft your application carefully.
How do I know who to call?

- Visit NIH institute web pages to see what different institutes support and what their interests are.
- Ask colleagues who do similar work who supports it
For Fellowships or New PIs
Identify a mentor(s)

- with a track record
- with a commitment to you & your career goals
- need not be your research advisor
- more than one is OK!
It Pays to Plan ahead

- Grant writing takes time...probably more time than you expect
- Bounce ideas off mentors & colleagues
- Talk to program staff
- Decide on your target deadline
- Get organized
Know Your Audience

- Reviewers are scientists from academe and industry.
- Reviewers do review for study sections in addition to their regular job
SELECTION OF PEER REVIEWERS

Active and Productive Researchers

Research Capability

Non-Research

Non-Doctoral

Scientific Community
Don’t be creative…make the reviewers’ job easier

- Use the correct forms (PHS398 or PHS416)
- Follow the instructions
- Follow the recommended format
- Fill the forms out completely
- Don’t guess—ask questions
Demonstrate mastery of your research topic

- Explicitly state your rationale.
- Cite the appropriate literature thoroughly.
- Include preliminary data.
- Identify problematic aspects of hypotheses or techniques; indicate back-up strategies.
- Provide expected/alternative outcomes and interpretations.
- Don’t forget your training/career development plan!
Grants Have Several Parts: All of Them are Important

- Face Page, Budget, and BioSketches
- Abstract
- Resources
- Research Plan
  - Specific Aims
  - Background & Significance
  - Preliminary Results
  - Research Design
  - Human Subjects, Vertebrate Animals…
Be creative but pragmatic…

β Formulate your Specific Aims
β Seek feedback
  β Focused?
  β Feasible?
  β Realistic (not overly ambitious)?
  β Good training vehicle for you?

β Did I say “Focus”? Be certain every aim and experiment is clearly related to the overall goal of your proposal.
For An Effective Specific Aims Section:

- Background (introductory paragraph)
  - Overall Goal (Big Picture)
  - Put your area of research in perspective
- Summary of preliminary results
Background and Significance

- Do not write it as a review article
- Highlight controversies and how they will be solved by the proposed experiments
- Link controversies and outstanding issues to relevant sections in your grant
Clarity is a Virtue, Especially in the Research Design

- Restate aim
- Rationale
- Approach/expected outcomes
- Potential Pitfalls
Consider the review criteria

- The candidate: your background and potential to develop into an independent researcher
- Research plan: its scientific merit, significance, feasibility & relationship to your career plans
- Training/career development plan: its components & how well it fits the research plan
- The sponsor: his/her track record as both a researcher and mentor
- Institutional environment & commitment to the training/career development of the candidate
Keep The Basic Review Criteria in Mind:

- Significance
- Approach
- Environment
- Innovation
- Investigator
- Human Subjects/Vertebrate Animals
Crafting The Application

- Write clearly and don’t assume that the reviewers know all that you know.
- Explain the importance and impact of the project.
- Organize the specific aims around testable hypotheses.
- Present a coherent and detailed research plan based that is based on the preliminary results that are available.
- Explain how expected results will be interpreted. Mention problems and pitfalls that may be encountered. Provide alternative plans when appropriate.
Help the reviewers do their jobs

- Use a “reviewer-friendly” format.
- Present the proposal in “bite-sized bits.”
  Use section headings, bold type, etc. to enhance readability.
- Be concise!
- Walk the reader through the experiments.
  Don’t just present a list of methods.
- Include an explicit timeline.
A strong research proposal...

- Has well-defined Specific Aims.
- Proposes novel, interesting & focused experiments.
- Is likely to advance knowledge.
- Provides supporting Preliminary Data.
- Has an appropriately detailed Experimental Design.
- Documents appropriate scientific expertise.
- Has a reasonable & justified budget.
- Training applications need other strengths too.
Improving The Application

- Typos and poor grammar leave a negative impression.
- Don’t be overly ambitious. (In a summary statement, the adjective ambitious is usually not a positive comment.)
- Write a strong application not a long application.
- Start early, Finish early, Put the application away for a week-then reread it.
Get a Review from Colleagues

- At least 4-6 weeks before your grant is due
- At least one person outside the field
- Is it clear?
- Do aims seem connected?
- Are there typos, missing citations, etc?
Don’t assume…don’t be sloppy

- Don’t assume the reviewers will *know what you mean*…be clear.
- Watch grammar. Avoid jargon.
- Make sure you’ve completed all required sections in the indicated order.
- Get in-house critiques well in advance of the deadline.
- Spell check *and*
- Read your application carefully before submitting.
About Using Color…

- Grants come to the NIH in hard copy
- Multiple copies of your application are made for reviewers
- They only see black and white
Common problems to avoid

- Lack of new or original ideas
- Absence of an acceptable scientific rationale
- Lack of knowledge of relevant, published work
- Overly ambitious research plan
- Superficial or unfocused research plan
- Questionable reasoning in experimental approach
- Lack of experience with an essential methodology
- Insufficient experimental detail
After Your Grant is Submitted
Referral, Review, and Funding
Role of Study Section

- Scientific Review Groups (SRGs) are to evaluate the scientific or technical merit of an application.
- SRGs do NOT make funding recommendations.
Study Sections

- Reviews conducted by Center for Scientific Review (CSR) and individual Institutes/Centers (IC’s)
- Each standing study section has 12-24 members, primarily from academia
- Study sections managed by Scientific Review Administrator (SRA)
- As many as 60-100 applications are reviewed at each study section meeting
When You Have Your Assignment

- You may call the SRA to find out about sending additional information
- Rosters are posted approximately 30 days before the study section meets
- Look at the roster when it is posted.
  - Expertise
  - Conflicts of Interest
Before The Review

- The **SRA** is your point of contact **prior** to the review meeting.
- Your **program administrator** is your point of contact **after** the review meeting.
No-Nos – Don’t Do These

- Do **not** contact a study section member prior to the review.
- Do **not** contact a study section member after the review.
What Happens at the Review?

- The SRA assigns each grant to three reviewers well before the meeting.
  - Primary, secondary, and discussant
- Before the meeting, reviewers submit their comments to IAR.
- SRA determines (with Chair) what applications appear to fall in the lower half.
  - These applications may be streamlined at the beginning of the meeting.
Streamlining

- Occurs at the beginning of the review meeting
- Applications are not discussed
- Applicants receive critiques of reviewers that were written before coming to the meeting
At The Meeting

- After streamlining, discussion of applications in upper half.
- Each assigned reviewer makes comments.
- Discussion by group in general about points of agreement/disagreement.
- Everyone votes a score based on what they heard in the discussion and the recommendations by the reviewers.
The Review Criteria

- **Significance**: Does the study address an important problem? How will scientific knowledge be advanced?

- **Approach**: Are design and methods well-developed and appropriate? Are problem areas addressed?

- **Innovation**: Are there novel concepts or approaches? Are the aims original and innovative?

- **Investigator**: Is the investigator appropriately trained?

- **Environment**: Does the scientific environment...
After the Review Meeting

- Scores are entered into database and released.
- SRAs prepare summary statements with revised critiques
Summary Statement

- Overall resume and summary of discussion
- Essentially unedited critiques
- Priority score and percentile ranking
- Budget recommendations
- Administrative notes
- Animal/human subjects concerns
Common Problems in Applications

- Lack of new or original ideas
- Absence of an acceptable scientific rationale
- Lack of experience in the essential methodology
- Questionable reasoning in experimental approach
- Uncritical approach
- Diffuse, superficial, or unfocused research plan
- Lack of sufficient experimental detail
- Lack of knowledge of published relevant work
- Unrealistically large amount of work
- Uncertainty concerning future directions
You Get Your Summary Statement: Now What?

- Scored applications
  - Wait for your summary statement
  - Do not call the SRA
  - Call your program administrator
- Unscored applications
What if my application is not scored?

- Wait for the comments from the reviewers.
- Call your program administrator
  - Rewrite
  - Rewrite and submit to different study section
If you need to revise

- Discuss the summary statement; get help in revising.
- Be polite.
- Be responsive to all of the reviewers’ criticisms.
- Put all ego aside. If in doubt, do it their way.
How to Respond to Criticisms

- Some criticisms are fairly easy to address:
  - The preliminary data in Figure 1 could be interpreted as chromatid exchange, but the PI did not discuss this possibility.

- We have new preliminary data (shown in section) OR

- This is true, and I appreciate the reviewer’s taking the time to point it out. I have included this possibility my discussion of our preliminary data...
Others are more difficult…
“The research plan is overambitious.”

Remove a large section(s) of the grant?

Reach a compromise?

Argue against removing any experiment?
Last, but hardly least…

β Celebrate your efforts.
β Don’t forget to call us.
β Have fun doing science.