Grant Writing Basics and Keys to Successful Grant Writing

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Proposal Development Process

1. Define your project
2. Find a funding source
3. Find specific opportunity within source
4. Do your homework
5. Talk to the program officer
6. Write the proposal
7. Ask colleague(s) to review a draft
8. Refine and submit
Step 1: Define Your Project

- What is the project? What will you do?
  - “I will design a new airplane wing…”
  - “I will develop algorithms for Markov Chain Monte Carlo implementation on large data sets…”

- What are the project goals?
  - “…to improve aircraft stability”
  - “…to find a way to apply Monte Carlo methods to problems in evolutionary biology”

- If successful, what will the outcomes be?
  - e.g., an airplane with a stability factor of 0.99
Step 2: Find a Funding Source

- Visit agency and foundation websites
  - Mission statement
  - Goals
  - Strategic plans, research priorities, roadmaps

- **NSF** - “To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense.…”

- **NIH** - “Science in pursuit of fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to extend healthy life and reduce the burdens of illness and disability.”
Step 2: Find a Funding Source, *cont.*

- **Big Agencies**
  - National Science Foundation
  - National Institutes of Health
  - Department of Energy
  - NASA
  - Department of Defense: Office of Naval Research, Department of the Army, Air Force Office of Scientific Research, Defense Advanced Research Projects Agency

- **Private and Corporate Foundations**
  - Sloan, Keck, the MacArthur Foundation, HP, Microsoft, Intel…
Step 3: Find a Funding Opportunity

NSF Org Chart
The Mission of the National Institutes of Health is science in pursuit of knowledge to improve human health. This means pursuing science to expand fundamental knowledge about the nature and behavior of living systems; to apply that knowledge to extend the health of human lives; and to reduce the burdens resulting from disease and disability.

The National Institutes of Health seeks to accomplish its mission by:

- Fostering fundamental discoveries, innovative research, and their applications in order to advance the Nation’s capacity to protect and improve health;
- Developing, maintaining, and renewing the human and physical resources that are vital to ensure the Nation’s capability to prevent disease, improve health, and enhance quality of life;
- Expanding the knowledge base in biomedical, behavioral, and associated sciences in order to enhance America’s economic well-being and ensure a continued high return on the public investment in research; and
- Exemplifying and promoting the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science.
Step 3: Find a Funding Opportunity

- Funding Opportunity Announcement (FOA)
- Request for Proposals (RFP)
- Request for Applications (RFA)
- Parent Announcement (PAR)
- Program Announcement; Program Description
- Program Solicitation
- Call for Proposals
- Broad Agency Announcement (BAA)
Step 4: Do Your Homework

- Read the solicitation
- Find out who else and what else is funded
  - CRISP (NIH)
  - Award search (NSF)
Step 5: Talk to the Program Manager

- Do your homework first
- Do prepare a brief description of the project
- Do have specific questions ready
- Do be respectful of their time
- Don’t ask what they have funded recently
- Don’t go on (& on) about your capabilities
- Don’t ask how much $ you should ask for
- Don’t be shy to ask for clarification
Step 6: Write the Proposal

- Proposal ≠ Research Plan

- Proposal = Research Plan + Budget + Budget Justification + Bio(s) + Letters of Support + References Cited + Facilities and Equipment List + Project Summary + Abstract + …
Step 7: Vet the Proposal

- Ask colleagues to review the draft
  - Within institution
  - Outside institution
  - Department Chair
  - Program “fundee”
  - Someone who isn’t your best friend (/relative)
- Ask for substantive feedback
- Allow plenty of time
Step 7: Vet the Proposal, continued

- Your reviewers need to understand
  - What you intend to do
  - How you’re going to do it
  - Why it’s important
  - What the outcomes will be (if successful)

- If they don’t get it, you must revise
Step 8: Refine and Submit

- Incorporate feedback
- Set aside
- Revise
- Ask for another review
- Submit
Step 9: Reviews

- Can take up to six months
- Panel versus ad hoc reviews
- Review criteria
Step 9: Reviewers

**Program director**
- Generalist in your field
- Busy
- Looks at all proposals
- Runs merit review
- Helpful, can be cranky
- Wears reading glasses

**Reviewer**
- Generalist/Specialist in your field
- Very busy
- Reads one proposal in detail
- Wants to be doing anything else
- Often helpful, can be grumpy
- Has eyestrain

**Panelist**
- Broad Expertise
- Very, very busy
- Reads many proposals (~50)
- Compares and ranks proposals
- Just wants to be done
- Has glasses & eyestrain
Most Common (Process) Errors

- Missing pieces (e.g., a required letter of commitment)
- Proposer didn’t follow directions
- Proposal didn’t match program research priorities (“poor fit”)

![Crying Baby]
Best Practices (Process)

- Prepare a checklist of tasks; assign deadlines (*)
- Start early & plan to submit early
- Keep a notebook or file handy for notes
- Contact the program officer
- Read successful proposals
- Attend workshops and webinars
- Sign up for new funding opportunity notifiers
- Don’t write the application for yourself

Unless you are going to fund it yourself
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<tr>
<th>Task (Drafts)</th>
<th>Deadline/Date</th>
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<tbody>
<tr>
<td>Goals, Objectives, Desired Outcomes - Draft 1</td>
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<tr>
<td>Research Plan - Draft 1</td>
<td>10/15/09</td>
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<td>Send Draft 1 RP to Karyn Moore</td>
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<td>Research Plan - Draft 2</td>
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<td>Finalize Budget and Draft Budget Justification</td>
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<td>Send Draft 2 RP to Prof Johnson for review</td>
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<tr>
<td>Contact Jane Doe to set up meeting</td>
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<tr>
<td>Contact VC for Research to set up meeting</td>
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<tr>
<td>Talk to Karen and Nick re XXX</td>
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<tr>
<td>Meet with Jane Doe</td>
<td>10/13/09</td>
</tr>
<tr>
<td>Follow up with John M to confirm commitment</td>
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<table>
<thead>
<tr>
<th>Letters</th>
<th>Deadline/Date</th>
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<tr>
<td>Send reminder to Professor Johnson re: letter due 10/30</td>
<td>10/22/09</td>
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<tr>
<td>Final letter due from Professor Johnson</td>
<td>10/30/09</td>
</tr>
<tr>
<td>Send draft letter of support to Professor Drake</td>
<td>10/22/09</td>
</tr>
</tbody>
</table>
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Proposal Writing Process

- Define the project: what, why, how, so what?
- Re-read the program announcement
- Start with an outline
- Write the pieces in order, except…
- … Write the abstract (or project summary) last
- Set aside → revise → send to colleague(s) for review → revise → … → proofread → submit
Simple Concepts for a Good Proposal

- The most important things always come first
  - *Summarize at the beginning of a section, not the end*
  - *The first sentence defines each paragraph*
- Don’t be afraid to reframe important concepts
- Use bold and underlined headings wisely
- Figures and captions are important
  - *Figures give the reader some eye candy*
  - *Make them tell a story on their own*
Simple Concepts for a Good Proposal

- Make it easy to read
  - *White space*
  - *Avoid passive voice*
- Follow the prescribed format
  - *Abstract*
  - *Specific Aims*
  - *Background and preliminary data*
  - *Methods*
Simple Concepts for a Good Proposal

- Inspire confidence
  - You don’t have to be a senior investigator or
  - Be confident in your abilities and the words you use
  - Do NOT give up after rejection
  - Learn how to respond to a negative review

- Proofread
  - Have someone else read your proposal
  - Take a break, then re-read
  - Spell check!
Proposal Writing Tips & Best Practices

- Start early
- Create a proposal production schedule (timeline)
- Line up colleagues in advance to review drafts
- Allow plenty of time to write the abstract (or project summary)
- Understand the review process & review criteria
Proposal Writing - Tips

- **Avoid platitudes**: “getting the right information to the right place at the right time” does not describe a goal unique to any proposed effort.

- **Be specific**: cite a specific user ("dismounted fire team") or technology ("geometric hashing") in lieu of generic terms such as "warfighter" or "intelligent agent."

- **Be quantitative**: whenever possible, replace generic adjectives (e.g. "high data rate") with numerical values ("greater than 1.2 megabytes/second").
Proposal Writing - Tips

- **Think it through:** A good idea or a good starting point is not enough. You must develop the idea, have a vision for the outcome, and provide arguments for feasibility.

- **Address issues:** How are you going to deal with problems? Be honest. Address issues upfront instead of trying to hide them.

- **Avoid generalizations:** Verbose elaborations of broad problems and generic solutions, however eloquent, do not provide the detail needed for evaluation. (From a DARPA BAA.)

- **Avoid overusing adverbs like “very” and “extremely” and “highly”:** save them for when you really mean them.
Common Reviewer Feedback
Thanks and good luck!

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