How To Up Your Grant Writing Skills
You Can Do This

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NIH Funding for 2020

- Total grant funding: $30,761,000,000
- # of applications received: 56,169
- # of applications funded: 11,332
- Success rate: 20.6%
- Average funding: $566,744
## NIH Funding for 2020

<table>
<thead>
<tr>
<th>Institute</th>
<th>Funding (in millions)</th>
<th>Institute</th>
<th>Funding (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMHD</td>
<td>$ 285</td>
<td>NIDDK</td>
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<td>NIAAA</td>
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<td>NHGRI</td>
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<td>NICHD</td>
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<td>NHLBI</td>
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<tr>
<td>NIDA</td>
<td>$ 1,218</td>
<td>NIAID</td>
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<tr>
<td>NIMH</td>
<td>$ 1,627</td>
<td>NCI</td>
<td>$ 3,882</td>
</tr>
</tbody>
</table>
Each Institute or Center at NIH Is Unique

Remember

• Each IC has its own mission
• Each IC has its own budget
• Each IC has its own activities
• Each IC has its own way of doing business
• The goal of this exercise is to submit the best possible grant application, and to do that every time you apply.

• You want to start on solid ground and have a strong plan.

• Allow enough time
Overarching Information

• Attention to detail is crucial
• Set up your documents in advance
• Put yourself in the reviewers’ shoes
Choosing the *Right* FOA

• Choose the right funding opportunity
• Your idea must appeal to the funder
• Your study idea must fit with an appropriate funding opportunity. Finding that alignment between your idea and the FOA is the first step to writing a successful research proposal. It is necessary, but not sufficient.
• These strategies will serve you well for funders other than NIH and other NIH mechanisms.
Important Recommendations

1. Regarding NIH
   -- Spend time at the NIH website
   -- Read (and follow) the FOA instructions

2. Use the RF’s Award Pre-Proposal Support system
Follow the Instructions

• Carefully read the FOA.
• Follow the instructions!
• Follow the instructions!
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• Follow the instructions!
What makes a research project outstanding?

• Addresses an important problem clearly
• Potential to lead seminal new observations or new ways of thinking
• Lays the foundation for further research in the field
• Addresses a difficult problem in a way that seems simple in retrospect
  • Makes reviewers wonder why they didn’t think of the idea themselves
• All aspects of the problem are clearly linked
Key Features of Successful Applications (What gets funded)

• Hypothesis
  • A meaningful hypothesis and a means of testing it
  • A sound rationale for the hypothesis

• Preliminary Data
  • Documents the feasibility of the proposed project
  • Shows appropriate training for research proposed and ability to interpret the results
  • Include alternative interpretations and address limitations of the methods
Key Features of Successful Applications (What gets funded)

• Well Organized Research Plan
  • Aims focused (relate to each other and the hypothesis)
  • Rationale for methods proposed, with alternatives
  • Research flow and priorities clearly indicated
  • Sufficient experimental detail to show you understand the methods
  • Emphasize MECHANISM (avoid “descriptive data gathering”)

Overview
Ask Yourself

• Significance
  • Does this study address an important problem?
  • How will scientific knowledge or clinical practice be advanced?
  • What effect will these studies have on the field?

• Approach
  • Are the conceptual or clinical framework, design, methods, and analyses, adequately developed, well-integrated, well-reasoned, and appropriate to the aims of the project?
  • Does the applicant acknowledge potential problems and consider alternative tactics?
Overview
Ask Yourself

• Innovation
  • Is the project original and innovative?
  • Does the problem challenge existing paradigms or clinical practice?
  • Does the project develop or employ novel concepts, approaches or methodologies for this area?

• Investigators
  • Are the key personnel appropriately trained and well suited to carry out this work?
  • Is the work proposed appropriate to the experience level?
Overview
Ask Yourself

• Investigators (continued)
  • Does the investigative team bring complementary and integrated expertise to the project?

• Environment
  • Does the scientific environment in which the work will be done contribute to the probability of success?
  • Do the proposed studies benefit from unique features of the scientific environment?
  • Is there evidence of institutional support?
Reviewers Appreciate a Highly Readable Application

• Write a topic sentence for each main point
• Make only one point in a paragraph
• Keep it short and simple
• Use short sentences with basic structure
• Include transitions
Reviewers Appreciate a Highly Readable Application

• Keep related ideas and information together
• Use strong active verbs
• Use verbs instead of abstract nouns
• If writing is not your strength, hire an editor
Most Common Reasons for Triaging

• Rationale for hypothesis or methods not sound or not supported by preliminary data
• Unfocused or superficial research plan
• Aims do NOT address the hypothesis
• Flaws in the experimental approaches
• Unrealistically large amount of work proposed
• Work not new or original (*lack of appreciation of relevant published work*)
• Lack of experience in essential methods
• Insufficient experimental detail
• Serious risks to human subjects
“Agreed. We will only fund proposals we understand.”
NIH Reviewers

• Are overcommitted and overworked
• Often only peripherally interested in the topic of your proposal
• Make their jobs easier
• Avoid irritating them
Time for some unsolicited advice: I am spending my Sunday reviewing grants. Please for the love of all that is holy have someone proofread your grant and remember to label your figures. I shouldn't have to work this hard to understand it. *Best*, a grumpy grant reviewer. 😞
Problem, Gap, Hook, Solution

Problem, Gap, Hook, Solution Framework

PROBLEM — GAP — HOOK

LONG TERM GOAL

PROJECT OBJECTIVE

GENERAL HYPOTHESIS

SPECIFIC
AIM 1

SPECIFIC
AIM 2

SPECIFIC
AIM 3

EXPECTED OUTCOME
No amount of grantsmanship can overcome a poorly conceived idea. But good grant writing can and does help make a compelling, outstanding idea that attracts the attention of reviewers.
<table>
<thead>
<tr>
<th>Section of Application</th>
<th>Page Limits * (if different from FOA, FOA supersedes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Summary/Abstract</td>
<td>30 lines of text</td>
</tr>
<tr>
<td>Project Narrative</td>
<td>Three sentences</td>
</tr>
<tr>
<td>Introduction to Resubmission or Revision Application (when applicable)</td>
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<tr>
<td>Applicant's Background and Goals for Fellowship Training</td>
<td>6</td>
</tr>
<tr>
<td>Specific Aims</td>
<td>1</td>
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<tr>
<td>Research Strategy (R03, R13, R21)</td>
<td>6</td>
</tr>
<tr>
<td>OR</td>
<td></td>
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<tr>
<td>Research Strategy (R01, R15, R33, R34)</td>
<td>12</td>
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<tr>
<td>Biographical Sketch</td>
<td>5</td>
</tr>
<tr>
<td>Sponsor and Co-Sponsor Statements</td>
<td>6</td>
</tr>
</tbody>
</table>
Grant Writing Steps

1. Draft your Specific Aims page.
2. Shop it around. (Get feedback)
3. Refine your idea.
4. Write your full proposal
5. Revise it based on feedback
SPECIFIC AIMS

• This is the MOST important part of your proposal.
• Think of the specific aims as the strong foundation of your study.
• Think of it like architecture. You may need to change the blueprints before you build the building.
• Use the specific aims page to make sure your idea fits the funders priority.
Creating the Background to Specific Aims

• Why did you choose this area of research?
• What do you find fascinating about it and why?
• What questions are you trying to answer?
• Why are those question exciting to you?
• What problems are you trying to solve?
Creating the Background to Specific Aims

• What do we know from the literature?
• Are there different ways of looking at/solving the problem?
• Why is your way of looking at/solving the problem the best?
• Why are you/your team the right one(s) to be answering the question?
• What will you be able to contribute once you have the answers to your question?
• Why does that contribution matter?
Writing Your Specific Aims: Define the Problem

• Move from Broad to Specific
• Focus on where the field is stuck – where is the barrier to progress?
• Describe the problem in a way that’s relevant and consequential
• Think of it as broader in scope than the current proposal
• Set yourself up at the beginning of program of research for the next several funding cycles.
• This is your long-term goal.
Writing Your Specific Aims

• Look at the Specific Aims Worksheet.
• This is where you need to begin.
• The moving from broad to specific is especially important with your Specific Aims.
Writing Your Specific Aims

• Ask your co-investigators and trusted colleagues to review your specific aims page from a conceptual perspective.

• Ask for specific feedback. This is a draft and you are looking for feedback on the objectives and aims.
Consider framing the problem for a general educated audience rather than an audience of sub-specialists (i.e., better to assume total ignorance and infinite intelligence than assume the problem is self-evident).
Enthusiasm works well here. The best introductions convey your interest and excitement about the topic, the problem, and the background. You’re bringing your audience up to speed on your view of the problem.
The purpose of this iteration is to get feedback on your idea. You will refine it later.
Refine Your Idea

• Step away from your Specific Aims page. It is easier to see what needs fixing after a break.
• Get the feedback from others.
• Based on your and others’ assessment refine your idea(s)
Shop Your Specific Aims Around

• Go to people who know the field. Think: co-investigators, colleagues, mentors, NIH Program Officers
• Review your specific aims page from a theoretical perspective
• Make sure your idea is a good fit for an IC’s mission and goals
• Use the draft Specific Aims page to identify a potential NIH Program Official (NIH Reporter)
NIH Reporter: Finding the Right Project Officer
NIH Reporter: Finding the Right Project Officer

**Matchmaker**

Enter abstracts or other scientific text to find potential Program Officials, ICs, and review panels for your research. ?

15,000 characters left

- Similar Projects
- Similar Program Officials

Reset  Search
WRITING YOUR FULL PROPOSAL

• The specific aims are the basis for your full proposal.

• Begin writing your full proposal only after you have a solid concept in the form of your specific aims.
Thank you!  Any questions?