

# Grant Writing Strategy

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# What I'm Covering Today

1. What to Do Before You Begin Writing (specific to HCSP but also can be applied to any grant proposal you write)
2. Specific, step-by-step, writing-strategy walkthrough of the HCSP application



# **Part I. What to Do Before You Begin Writing**

# Step 1 Before You Write (BYW): Perform Grant Reconnaissance

- By taking the time to understand the funding opportunity, you can be sure that you're writing a competitive proposal
- Things to learn:
  - Who funds this and why? What is their mission?
  - How many awards are given out each year? How much \$?
  - What kinds of people win the awards?
  - What kinds of projects does this sponsor like to fund?
  - What does a successful proposal to this sponsor look like?
  - What are the review criteria (Step 2)?
  - How does the review process work (Step 3)?

# Step 1 Before You Write (BYW): Perform Grant Reconnaissance

- When we're writing NIH proposals, we use several tools to do our grant reconnaissance:
  - NIH RePORT (funded awards database)
  - Google
  - Peers and Mentors (NIH is the biggest federal sponsor of UT research)

## Step 2 BYW: Understand the Review Criteria

To win a funding competition, you need to meet all of the stated review criteria.

### HCSP review criteria:

- Scientific **significance** and **innovation** of the work
- Soundness of the proposed methods (**approach**)
- **Feasibility** of accomplishing the stated goals of the project
- An **interdisciplinary team** that can achieve the goals of the project
- Potential for contributing to further research (**impact**)

## Step 3 BYW: Understand the Review Process

- At most federal agencies, and for HCSP, proposals undergo peer review (review by fellow academics or other PhD-level researchers)
- In most instances, multiple people will review your proposal independently and will be asked to comment on its strengths and weaknesses **according to the review criteria**
- Then, all the reviewers will meet as a panel, discuss what they've read and assign an overall rank or score to each proposal.

### Remember, in *any* review process:

- (1) Yours is one of many proposals that a given reviewer is expected to evaluate
- (2) The reviewer doesn't really *want* to read your proposal; it was assigned to them to read
- (3) Your proposal has only a few minutes in the spotlight
- (4) Only a few reviewers, if any, will be "experts" in your subject

# Review Panels: Perception vs. Reality



How you think your proposal will be reviewed



How your proposal will actually be reviewed

Your proposal is one of **many** being reviewed.

Reviewers are pressed for time.

Make it **easy** for them to see why your work is significant.

Make it **easy** for them to confirm that you've met all the review criteria.

## Tip to Write Better Proposals: Think About Your Reviewers When You're Writing

- **Being on a review panel is like jury duty for researchers.**
- You're only going to get attention for about 10 minutes during the panel, so make your key information easy to find and recall. **Write for skimming:** use section headings, white space, bulleted lists, boldface text, etc.
- Never assume your reviewers know as much as you do about your topic. Clearly explain the major challenges and innovations in your work.
- Rarely will a reviewer get to read your entire proposal in one sitting, so re-emphasize your major points throughout, and make your first page and proposal summary the most perfect, most concise description possible of what you want to do.

# Step 4 BYW: Assemble Your Team

*How do I find collaborators?*

- Look at recently funded HCSP proposals (posted on the HCSP homepage)
  - *The academic departments or colleges/schools/units listed here could be good places to look*
  - *Ask the previously funded HCSP PIs how they found their collaborators*
- Attend seminars in disciplines outside your own; make note of the grad students who are involved in the research and reach out to them. Ask them – what are the challenges in *your* field?
- What other networking opportunities exist?



# The Timeline

Activity	Date or Deadline
Letter of Intent including names of collaborators and faculty mentor; 1-paragraph summary of project	12/9/2016
<b>Full Proposal Deadline</b>	<b>1/20/2017</b>
Review, Scoring and Selection by Faculty Panel	February 2017
Funded Projects begin	March 2017

# The Major **REQUIRED** Parts of the Application

Section	Page Limit
Letter of intent including 1-paragraph project summary	1
<b>Purpose and Significance of the Project (a.k.a. Specific Aims page)</b>	1
Background	1
Interdisciplinary Collaborative Activities	0.5
Plan and Methods (i.e., Approach)	2
Future Plans	0.5
CVs/Biosketches for PI (you) and Co-Investigators	Usually ~3-4 pages per person
Budget	Use template

**Font Size:** 11 pt or larger

**Font Style:** ?? (Most NIH proposals use Arial)

**Margins:** ?? (for NIH proposals this is 0.5 inch on all sides, nothing in the margins)

# **Purpose and Significance of the Project (a.k.a. Specific Aims) (1 page) – WRITE THIS FIRST**

- This section is equivalent to the Specific Aims page in an NIH grant proposal
- **VERY IMPORTANT PAGE** – most reviewers have made their decision on whether they want to fund you after they've read this page
- Write this 1 page first, then share it with your mentor and collaborators to seek their feedback and make revisions before writing anything else
- Make sure that every single one of the review criteria are addressed within this single page

# Outline for a Specific Aims Page

- Opening sentence that grabs the reviewer's attention
- Paragraph #1 provides background on what is known so far
- Paragraph #2 summarizes what is *not* known (knowledge gaps)
- Paragraph #3 defines **What?/How?/So What?:**
  - **What** does your team want to do to fill those knowledge gaps?
  - **How** are you going to do it?
  - **So What?** If you're successful, what's the impact?
- Paragraph #3 ends with the Specific Aims - List 2 or 3
- Close with a short paragraph addressing impact (the bigger "So what?")

## Specific Aims Should:

- Include specific research objectives
- Be hypothesis-based (they must answer a research question)
- Be obtainable within the proposed timeframe (1 year)
- Fit together in an overall framework
- Be well-focused rather than broad and diffuse

Your Specific Aims should directly test your hypothesis, i.e., they should directly address some big research question. It helps to figure out your hypothesis first, and then determine your Specific Aims.

# Example of a Hypothesis and Specific Aims

“I hypothesize that the chemical signatures obtained from toenail clippings will be diagnostic of human cancers and can be used to characterize cancers rapidly in a clinical setting.”

**Aim 1: Define diagnostic chemical signatures in toenail clippings of people with and without cancer.**

**Aim 2: Develop an automated toenail analysis system for cancer detection in clinical settings.**

# Background of the Problem the Project is Intended to Address (1 page)

- A more expanded description of your problem statement and relevant background information (**significance**)
- Include statistics that help to define the problem and that demonstrate that it's a major problem (**significance**)
- Include literature references when describing what is known, and also to differentiate your **approach** from what's been tried already (**innovation**)
- Seek input from your collaborators to find relevant literature references for their portion of the project (**interdisciplinary team**)

# Interdisciplinary Collaborative Activities of the Proposed Study (0.5 page)

- This is where you justify why you need everyone who's been named on the proposal (**interdisciplinary team**)
- For each collaborator, describe:
  - Who are they, and what's their expertise
  - What work will they perform for this project
  - Example: Jennifer Gardner (3<sup>rd</sup> year grad student) is an analytical chemist with expertise in spectro-electrochemical methods development and instrument design. She will conceptualize and construct the point-of-care diagnostic device to be used in **Specific Aim 2**.
- The strongest interdisciplinary teams operate in a feedback loop, where discoveries from one person inform the other people's work

## Plan and Methods (2 pages)

- This is where you describe your **approach** and specific tasks to be performed
- This is not the Methods section of a journal article! You must convey to reviewers:
  - Why you've selected the studies you've chosen (soundness of **approach** – cite references)
  - What parts of your approach are **innovative** and why
  - Why it's necessary to deploy an **interdisciplinary team** to approach this (who's doing what?)
  - Why this approach is **feasible** (what evidence do you have that this will work? Cite or show your preliminary work.)

## Plan and Methods (2 pages)

- Organize your plan by Specific Aims
  - Write the Aims out again, in full, as section headings
- Make sure you are leading the reviewers through the information you are presenting
  - Establish why you are doing something before getting into the details of how you'll do it
  - Point out which parts are new or innovative
  - Don't forget to explain what you expect to learn from a specific experiment, trial, intervention, etc. What will your results tell you? What do they mean?

## Plan and Methods (2 pages)

- RFP also calls for a timeline in table form. Examples:

Activity	Mar- May	Jun- Aug	Sept- Nov	Dec- Feb
Specific Aim 1.				
- Subtask 1				
- Subtask 2				
Specific Aim 2.				

Activity	Mar- May	Jun- Aug	Sept- Nov	Dec- Feb
Specific Aim 1.	←→	←→		
- Subtask 1	←→			
- Subtask 2	←→	←→		
Specific Aim 2.		←→	←→	

## Future Plans (0.5 page)

- Tempting to condense this down to 0.25 page and write something superficial, but don't
- Reviewers will be looking at this section to assess the potential for future research (**impact**) in the topic area (it's a review criterion!)
- Mention national priorities that your study addresses (e.g., Precision Medicine Initiative, Cancer Moonshot) and how your outcomes could contribute to these
- Also mention how support through HCSP will impact your professional development as a student

# Breakdown of Proposal Sections vs. Review Criteria

Proposal Section	Should Address:
Purpose and Significance (a.k.a. Specific Aims Page)	<b>ALL CRITERIA! but most of all, Significance</b>
Background	<b>More Significance</b> <b>Innovation</b> Future Impact (a little)
Collaborative Activities	<b>Interdisciplinary Team</b>
Plan and Methods	<b>Approach</b> <b>Feasibility</b> Innovation Interdisciplinary Team
Future Plans	Future Impact (a lot)

# Other Required Parts

- **Reference List**
  - Consider using a referencing program like Zotero or Endnote
- **CV/Biosketch for PI and Co-Investigators**
  - Everyone should use the same style or format – send people a template to follow
  - This is a place to highlight your professional accomplishments
    - Publications
    - Conference presentations; other posters/talks
    - Software tools, online resources developed
    - Any awards received while in grad school

# Final Grant Writing Advice: Common Criticisms of Unsuccessful Proposals

- Lack of originality
- Research plan too unfocused/unclear
- Research plan overly ambitious/taking on too much
- Research goals/objectives poorly stated/unclear
- Questionable rationale for why the PI chose this approach
- Ignored/omitted literature that supports/does not support the proposed plan

**...reviewers make their judgements about *all* of the above issues by the time they've read the first few pages of your proposal!**

# More Grant Writing Advice: The Heilmeier Catechism

*A set of questions that anyone proposing a research project should be able to answer, according to George H. Heilmeier (1936-2014), former DOD DARPA Director:*

- What are you trying to do? Articulate your objectives using absolutely no jargon.
- How is it done today, and what are the limits of current practice?
- What's new in your approach and why do you think it will be successful?
- Who cares? If you're successful, what difference will it make?
- What are the risks and the payoffs?
- How much will it cost? How long will it take?
- What are the midterm and final "exams" to check for success?