



SOCIETY OF
RESEARCH
ADMINISTRATORS
INTERNATIONAL

Hitting the Bullseye with your Grantsmanship



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Introductions



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Expected Outcomes

- Identify key differences between academic writing and grant writing
- Identify key elements in a grant announcement and how to align winning proposals to meet those criteria
- Learn strategies to make a proposal more “readable”
- Identify strategies to coach researchers on grantsmanship



What is Grantsmanship?

- “The skill of grant writing”
- “The art of acquiring peer-reviewed research funding”
- “Persuading a government or organization to give your organization money”
- “Encompassing science methodology with marketing techniques”

Energizers

Stand up if you....

- Have read a really outstanding grant
- Have read a grant that could use some help
- Think grantsmanship is a common skill
- Think grantsmanship is an art form
- Think research administrators can help our researchers hit the grantsmanship bullseye

How is grant writing different than academic writing?

Academic Writing versus Grant Writing: Contrasting Perspectives

Academic Writing	Grant Writing
Scholarly pursuit: <i>Individual passion</i>	Sponsor goals: <i>Service attitude</i>
Past oriented: <i>Work that has been done</i>	Future oriented: <i>Work that should be done</i>
Theme-centered: <i>Theory and thesis</i>	Project-centered: <i>Objectives and activities</i>
Expository rhetoric: <i>Explaining to reader</i>	Persuasive rhetoric: <i>“Selling” the reader</i>
Impersonal tone: <i>Objective, dispassionate</i>	Personal tone: <i>Conveys excitement</i>
Individualistic: <i>Primarily a solo activity</i>	Team-focused: <i>Feedback needed</i>
Few length constraints: <i>Verbosity rewarded</i>	Strict length constraints: <i>Brevity rewarded</i>
Specialized terminology: <i>“Insider jargon”</i>	Accessible language: <i>Easily understood</i>

Porter, R. (2017). Reprint 2007: Why Academics Have a Hard Time Writing Good Grants Proposals. *The Journal of Research Administration*, 48(1), 15–

Grant Funding: The Perfect Storm

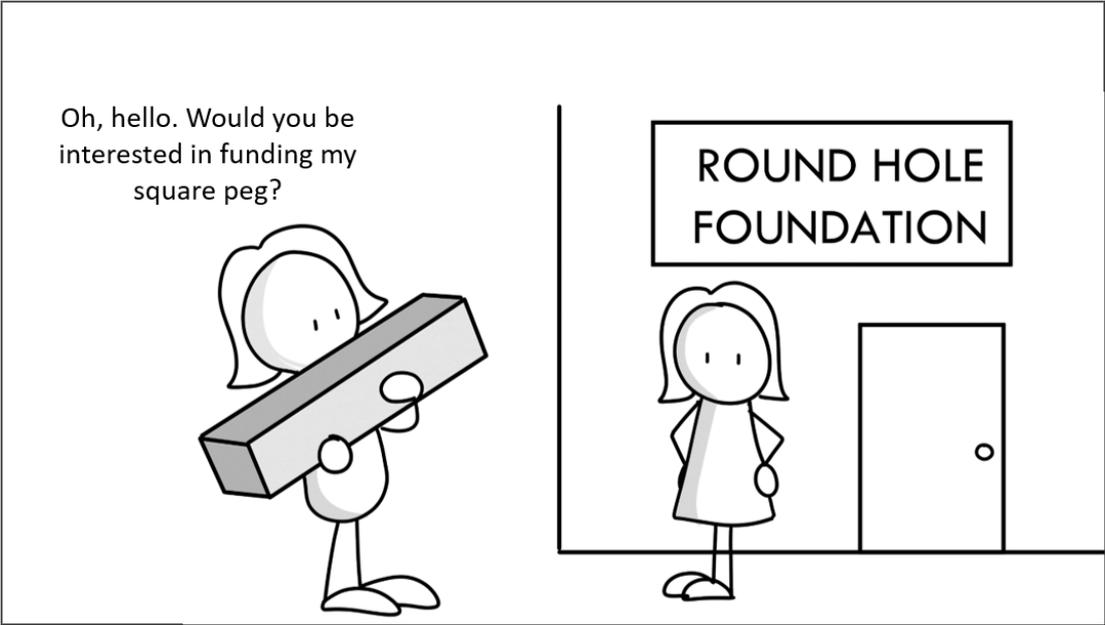
- Great Idea
- The Right Sponsor/FOA
- Clear Writing
- Impactful Proposal



Many Options to Enhance Grantsmanship Skills

- Develop in-house grantsmanship workshops
- Host external grantsmanship workshops
- Web resources
- Individual Faculty Consulting

Finding the Right Fit



Know your Audience: About the Sponsor

Sponsor	Mission Statement	What it Really Means
National Science Foundation (NSF)	"Expand knowledge in science, engineering and learning; Advance the capability of the Nation to meet current and future challenges; enhance NSF's performance of its mission."	NSF is primarily interested in advancing basic science and the STEM workforce. The impact needs to be about the underlying mechanism, not a disease state.
Department of Defense (DOD)	"To provide the military force needed to deter war and to protect the security of our country."	Any DOD proposal needs to explicitly state the benefit to military intelligence, health, materials, etc.
United States Department of Agriculture (USDA)	"to provide leadership on food, agriculture, natural resources, rural development, nutrition, and related issues..."	USDA is an often overlooked and misunderstood. While traditional agriculture is certainly a focus, there are many programs on nutrition, food safety, food security and obesity, as well as a robust education and training program.
The Welch Foundation	"The Welch Foundation, based in Houston, Texas, is one of the United States' largest private funding sources for basic chemical research."	This foundation is focused on fundamental chemistry; do not submit an applied chemistry proposal.
W. M. Keck Foundation	"The W.M. Keck Foundation seeks to generate far-reaching benefits for humanity by supporting pioneering discoveries in science, engineering and medicine, and organizations that enrich the lives of children, youth and families."	This foundation is focused on high-risk, high-reward research that has the potential to make a substantial impact.

Consulting with Researchers about the Sponsor

Part 1: Before the Writing

- Discuss sponsor and FOA with PI to help decide if it's a good match
- Encourage PI to discuss with program officer (if allowed)
- Encourage PI to weave sponsor/FOA priorities into proposal
- Suggest alternate sponsors/FOAs as needed

Part 2: Reviewing Proposal Responsiveness

- Offer to review proposal for responsiveness to sponsor/FOA
- Agree to a reasonable deadline
- Do the proposal aims and outcomes fit the goals of the sponsor? Of the FOA?

Create a Checklist

- Broad opportunities may have general guidelines -> checklist includes documents needed, deadlines
- Request for Proposals: More specific, seeking proposals that address particular problem
 - Any specific requirements
 - Any unusual requirements
 - Additional attachments/tables



Checklist Examples

Required Elements

COMPONENTS OF PROPOSAL	ELEMENTS TO COMPLETE	DESCRIPTION (including Research Forms F section number, e.g., R.100)	PERSON RESPONSIBLE
R&R Other Project Information Form	Required – Data Entry and Attachments	<ul style="list-style-type: none"> • Answer yes/no to all. • Complete sections as needed: Human Subjects, Vertebrate Animals, Proprietary Information, Environmental Questions, Historic Place, International Collaborators. • Attach Project Summary/Abstract, Project Narrative, Bibliography & References Cited, Facilities & Other Resources, Equipment, Other Attachments (see below for details). • Section R.220. 	
Project Summary / Abstract	Required – No longer than 30 lines of text	<ul style="list-style-type: none"> • A concise description of the proposed work for dissemination to the public and able to stand on its own, separate from the application. • State objectives and specific aims, making reference to the health relatedness of the project. • Describe the research design and methods. • Avoid descriptions of past accomplishments and first person. • Do not include proprietary, confidential information, or trade secrets. • Section R.220.7. 	
Project Narrative	Required – 2-3 sentences	<ul style="list-style-type: none"> • Describe project's relation to public health; for dissemination to the public. • Section R.220.8. 	

Review Criteria

Review Criteria	Notes
Significance:	
To what extent does the UM1 application clearly describe and justify a strategic vision to innovate CTS and further CTSA Program Goals; to what extent do applicants provide a plan to measure these innovations and progress towards the goals?	
To what extent will the hub contribute to the overall CTSA Program, a high-performance consortium marked by not only individual hub excellence but also by a nimble, highly responsive aggregate able to develop, demonstrate and quickly disseminate advances in diagnosis, treatment and prevention of human diseases? To what extent is the plan for dissemination and the proposed impact statement appropriate for the stated hub activities?	
Will there be coordination, interrelationships, cohesiveness, and synergy among the Elements as they relate to the stated research focus of the CTSA? How will the governance, collaboration, communication, and succession planning result in successful management of the proposed CTSA Program hub?	
Ethics and Team Science: To what extent does the CTSA hub support a commitment to a culture of open science and to sharing and implementing resources across CTSA hubs?	

Common Review Criteria Across Sponsors

Key Question	Review Criteria Terms
Why does it matter?	Significance; Importance
How is it new?	Innovation; Novelty; Creativity
How will it be done?	Approach; Plan; Methodology; Objectives; Aims
In what context will it be done?	Environment; Resources; Populations; Facilities
What is special about the people involved?	Investigators; Organization; People; Researchers; Personnel; Partners; Collaborators; Staff
What is the return on investment?	Impact; Value; Relevance
How effectively will the financial resources be managed?	Budget
How will success be determined?	Evaluation; Assessment

Proposal Components: What are they looking for? Why is it needed?

What they asked for	Why they want it
Abstract/Summary	Give first impression; used if funded
Project Plan	What are you going to do? Used for progress reports
Biosketch	Is the PI/team qualified?
Budget and Justification	Is it allowable/allocable/reasonable? Are team member roles reasonable?
Facilities and Resources; Equipment	Do you have what you need to do the work?
Other Support	Is there overlap with funded projects? Does the PI have the time to do the project?

Complex Proposal Components: What are they looking for? Why is it needed?

What they asked for	Why they want it
Multi-PI Plan	What is each person going to contribute? Does plan show coordination and cohesiveness?
Administrative Plan	Can you manage a large project?
Go/No-Go or Milestones	What are the decision points; is adequate progress being made?

Strategies to Coach Researchers on Grantsmanship

- Readability (“does it look right, does it read well?”)
- Providing Web Resources
- Serving as “Consultant”
- Providing constructive feedback

Making a proposal "readable" and "reviewable"

- Text vs. Graphics
- Subheadings
- Buzz words
- Key Phrases from the FOA

Help PIs make it easy for Reviewers

Subheadings: Sample from NIAID

B) Innovation:

The common approaches to developing new treatments for biofilms are either to find genes important for forming biofilms or to directly kill the bacteria in biofilms by novel drugs. These approaches have met with only limited success [55]. Our goal is to determine the structural and mechanical characteristics of biofilms *in vivo* and *ex vivo* and to identify the impact of these physical properties on disease course. For this, we will implement an innovative combination of techniques from both biological and physical sciences. Our approach allows elucidation of the mechanistic relationship between the physical characteristics of biofilm infections and the course of biofilm disease that are not accessible by conventional methods.

C) Approach:

Specific Aim 1: Determine the spatial structure and mechanics of biofilm infections in chronic wounds

Introduction: The *objective* of this aim is to determine the spatial structures and mechanics that develop in *P. aeruginosa* biofilm infections in chronic wounds. Here "spatial structure" means the size and number density of

Research Strategy

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ntact PD/PI: Gordon, Vernita

bacterial aggregates and the matrix heterogeneity within aggregates, and "mechanics" means viscoelastic responses to applied forces. The *working hypothesis* for this aim is that the structure and mechanics of *in vivo* biofilm infections in chronic wounds will follow development trajectories arising from the matrix-producing capabilities of the bacteria and pressure from the host immune defense. Our *approach* to testing this working hypothesis will be to use advanced imaging to assess biofilm structure and to use atomic force microscopy (AFM) and microrheology to measure mechanics. Both structure and mechanics will be measured *in situ*. The *rationale* for this aim is that *P. aeruginosa* is an important biofilm-forming human pathogen, but the types of structure and mechanics that arise in *P. aeruginosa* biofilm infections are largely unknown. These gaps in knowledge preclude identification of physical properties of biofilms as therapeutic targets.

Justification and Feasibility:

Review of Relevant Literature:

In vitro, biofilms can be millimeters or more in extent, but not *in vivo* [56-59]. Recent advances in

- Clear Headings and Subheadings
- Highlights items the reviewer will have to comment on
 - Innovation
 - Approach
 - Rationale
- Problem Statement

Buzzwords and Key Phrases: Sample from NSF CAREER

Project Description:

The Project Description section should contain a well-argued and specific proposal for activities that will, over a 5-year period, build a firm foundation for a lifetime of contributions to research and education in the context of the Principal Investigator's organization. The proposed project should aim to advance the employee's career goals and job responsibilities as well as the mission of the department or organization. The Project Description may not exceed 15 pages.

The Project Description should include:

- a description of the proposed research project, including preliminary supporting data where appropriate, specific objectives, methods and procedures to be used, and expected significance of the results;
- a description of the proposed educational activities and their intended impact;
- a description of how the research and educational activities are integrated or synergistic;
- a description of other broader impacts, besides the education activities, that will accrue from the project; and
- results of prior NSF support, if applicable.

Successful applicants will propose creative, effective research and education plans, along with strategies for assessing these components. The proposed activities should help applicants develop in their careers as both outstanding researchers and educators. While excellence in both education and research is expected, activity of an intensity that leads to an unreasonable workload is not. The research and educational activities do not need to be addressed separately if the relationship between the two is such that the presentation of the integrated project is better served by interspersing the two throughout the Project Description.

Sample from NIAID

RESEARCH STRATEGY

A. SIGNIFICANCE

Adeno-associated virus (AAV) vectors have been successfully used to transduce hepatocytes in Phase I clinical trials in patients with hemophilia B^{1,2}. However, clinical results have suggested that capsid specific cytotoxic T lymphocytes (CTLs) eliminated AAV transduced hepatocytes thus resulting in the therapeutic failure^{1,2}. These observations pose an outstanding concern regarding capsid antigen presentation in AAV transduced cells which are recognized and eliminated by capsid specific CTLs in clinical trials. Our prior studies have supported classical class I antigen presentation and cross-presentation of AAV capsid epitopes³. Most peptides to be loaded on MHC class I molecules are generated by proteasome degradation of newly synthesized ubiquitinated proteins. Exogenous protein can also be presented on MHC class I molecules through cross-presentation. Two main intracellular pathways for cross-presentation have been described: endocytic (TAP, proteasome-independent) and cytosolic (TAP, proteasome-dependent) MHC class I peptide loading¹⁷. In the TAP-independent pathway, exogenous antigens that have been endocytosed are degraded by proteases, and the resulting peptides bind to MHC class I molecules in late endosomes and lysosomes. In the TAP dependent pathway, the internalized exogenous antigens are transferred from the endocytic pathway to the cytosol and degraded by proteasomes; the resulting peptides are then transported to the ER via TAP. We have applied pharmacological agents and demonstrated that the classic MHC class I antigen presentation pathway plays a major role in AAV capsid antigen cross-presentation in AAV transduced cells *in vitro*¹². However, the mechanism of capsid antigen cross-presentation from AAV transduced cells *in vivo* is perhaps different from that *in vitro* due to the far more complex environment.

AAV vectors purified from cesium chloride (CsCl) density gradients have been applied in clinical trials; however, this purification approach is not scalable. Recently, ion-exchange chromatography has been studied to purify AAV vectors¹⁸⁻²¹. Unlike the CsCl approach, the chromatographic method cannot separate genome-containing particles of AAV vectors (full particles) from empty particles as it relies on the charge of the capsid surface. The contamination of vector preparations by empty particles inhibits transduction of genome containing AAV vectors and potentially increases the virus capsid antigen load in transduced cells²¹. Although empty AAV particles contain the identical protein components required for trafficking as full particles, our preliminary results demonstrated that capsid antigen presentation was significantly reduced in AAV transduced cells infected with AAV2 empty virions compared to full particles *in vitro*¹². This phenomenon may be interpreted as insufficient escape of these empty virions from the endosome²². However, our *in vivo* results demonstrated that capsid antigen presentation was induced from AAV empty virions. This finding is inconsistent with our *in vitro* observations and supports the likely scenario that a much more complex mechanism of antigen presentation occurs *in vivo*. Recently, empty AAV capsids were proposed to function as decoys in the clinical trials to allow AAV full particles to escape neutralizing antibodies²³, but liver damage was observed following systemic administration of AAV preparations contaminated with empty particles⁹, which alludes to the possibility that empty particles enhance capsid antigen presentation. Elucidation of the efficiency of capsid antigen presentation from empty virions, and the effect of empty virions on capsid antigen presentation of full AAV capsids following *in vivo* administration, will address the concern of whether contamination of empty AAV particles is a potential risk that increases antigen presentation in AAV transduced

What could help this excerpt?

- Subheadings
- Smart highlighting of key phrases
- Graphic/Schematic

*Rest of proposal did contain some of these elements

Simple Considerations that make a big impact

- Make sure different components are written in the “same voice”
- Use same color schemes/formatting throughout
- Incorporate tables, org charts and diagrams
- Include a “visual plan” of the project



Providing Web Resources

< Research & Scholarship Lifecycle < Proposal Development

Grant Proposal Checklists, Outlines, Tips and Templates

Research Development provides a curated list of resources related to general, NIH and NSF grant writing. Customized resources for other funding sources are available upon request.

General Grant Writing

Understanding a Funding Opportunity Announcement (FOA)

WEB

Contacting the Program Officer

WEB

Page One Guidelines

WEB

Timeline Template

DOC

How to Write an Effective Letter of Support

WEB

Writing Tips, Guidance & Resources

WEB

Dispute Resolution Plan for Complex Projects

DOC

NIH Grants

NIH Insights and Best Practices

PDF

Bioscience Format Pages, Instructions and Samples for NIH Grant Proposal

WEB

Talk to an Expert

Strategic Research Development experts can help you with targeted funding searches and proposal development.

Contact Strategic Research Development

- Start with what your researchers need
- Templates, tutorials (micro-videos), funded examples, sponsor links
- Keep it current

How to Approach Individual PI Consulting

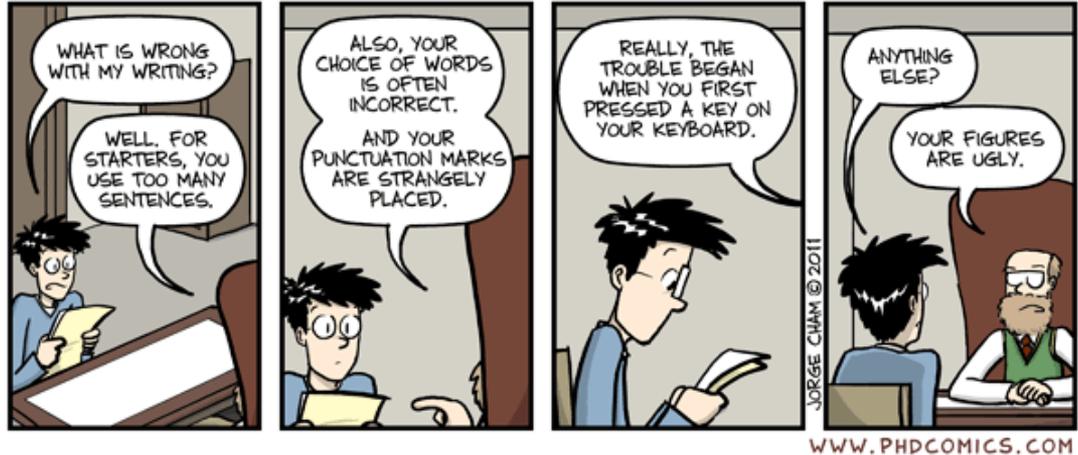
- Required:
 - Institutional and Sponsor Budget rules
 - Institution/Sponsor makes decision; polite, authoritative tone
- Suggestion:
 - Sponsor/FOA suggestions
 - Edits and suggested revisions
 - Faculty makes decision; consultant tone

Providing Feedback to Proposals

- Offer constructive suggestions, via track changes or comment
- Ask questions: “what about...”
- Rephrase to clarify: “this sentence reads ‘XYZ’; is that what you meant?”
- Jr. Researchers: May explain the “why” behind your suggestions

General Tips on Giving Feedback

- Keep it positive
- Offer to discuss the feedback
- Don't take it personally if they don't accept the feedback



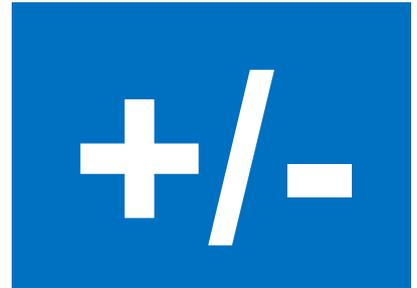
Consulting with Faculty: Pros and Cons

Pros

- Can produce better aligned ideas and proposals;
- Don't waste time submitting something that does not "fit"
- Distinguish between grant writing and all other writing
- Get to know your faculty
- Trust building

Cons

- Time consuming
- Guidance may not be taken or received well



Takeaways

- As RAs you can develop the skills to help PIs be successful in their grantsmanship
- RAs can provide constructive feedback and help with the “look” of the proposal (readable and reviewable)
- There are pros and cons of serving as a “consultant”
- Keep it positive

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Questions?



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