

Writing Competitive Research Grants in the COB

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Overview of this presentation

- Overview: keys to success
- Finding funding opportunities.
- Finding a fit: Building relationships with funders.
- Writing your proposal
- A few tips and 'do's and don'ts'.
- Submission and Review.
- So once you have the grant, now what?

Overview: keys to success

- Plan ahead- seek input
- Know the literature and the competition
- Find the right ‘fit’
- Get to know the funder
- NSF: “Ask Early Ask, Ask Often”
- Understand the review process and the review criteria

Overview: Why bother?

- Reasons to write research proposals:
 - \$\$\$
 - Independence
 - Innovation
 - Tenure and job advancement
 - Establishing formal collaborations and partnerships



Finding Funding Opportunities

- **Networking:** ask your peer colleagues, speakers, and others about their funding sources and knowledge, especially if they work on projects similar to yours, or are in areas that interest you.
- Sign up for relevant agency program notifications and listserves
- Foundation Center Network – Cayey Campus

Finding Funding (cont.)

- **Scholarly literature:** check acknowledgements in relevant professional literature to find funders interested in your topic area.
- **Databases:** search funding agency websites and publications and electronic databases for relevant opportunities.
- **Grants.gov:**
<http://www.grants.gov/web/grants/ho>



Where To Start



- Look at Federal Programs
 - NSF:
 - Partnership for Innovation: Building Innovation Capacity (PFI:BIC):
 - See <http://www.nsf.gov/eng/iip/pfi/bic.jsp>
 - Join the LinkedIn Forum on Smart service Systems: <https://www.linkedin.com/groups/NSF-Industry-Academe-Enabling-Smart-5109582>
 - SBE Directorate:
 - Social and Economic Sciences
 - Decision, Risk and Management Sciences
 - NIH
 - Most Institutes actively participate in SBIR/STTR; See <https://sbir.nih.gov/funding/individual-announcements>



National Institutes
of Health

Federal Programs (cont.)



– SBIR

- See: <http://www.sbir.gov/about/about-sbir>
- Only small business eligible to apply: COB can play a key role in partnerships
- Participating Agencies: USDA; Department of Commerce - National Institute of Standards and Technology; Department of Commerce – NOAA; Department of Defense; Education; Department of Energy; HHS; Homeland Security; Department of Transportation; EPA; NASA; NSF
- Goals:
 - encourages domestic small businesses to engage in Federal Research/Research and Development (R/R&D) with potential for commercialization.

Federal Programs (cont.)

– STTR

- See: <http://www.sbir.gov/about/about-sttr>
- Goals:
 - Stimulate technological innovation
 - Foster technology transfer through cooperative R&D between small businesses and research institutions;
 - Increase private sector commercialization of innovations derived from federal R&D
- Participating Agencies:
 - Department of Defense; Department of Energy; Department of Health and Human Services; NASA; National Science Foundation

Federal Programs (cont.)

- FAST (Federal And State Technology Partnership Program)
 - See <http://www.sbir.gov/about/about-fast-partnership-program>

- Department of Education
 - STEM
 - HSI in 2016
 - International Business Education
 - <http://www2.ed.gov/programs/iegpsbie/index.html>



Finding Funding: what can you learn from the Agency's Website?

- A description of their research mission, goals, programs.
- Sign up for email lists, including announcements of new funding opportunities.
- Budget information, including funding rates for various programs, mechanisms and disciplines.
 - e.g. NIH RePORT: <http://report.nih.gov/>

Agency websites (cont.)

- Org charts. (helpful to figure out funding areas and who to email or call!)
- Grant writing tips.
 - e.g. ACS Petroleum Research Fund:
<http://www.acs.org/content/acs/en/funding-and-awards/grants/prf.html>
 - NSF Guide for Proposal Writing:
http://www.nsf.gov/pubs/2004/nsf04016/nsf04016_5.htm
- Review processes.

Internet Resources (cont.)

- **The Foundation Center Proposal Writing Short Course:**
 - <http://foundationcenter.org/getstarted/tutorials/shortcourse/index.html>
 - Good outline for foundation proposals
- California Digital Library: Data Management Plan Tool (DMPTool):
<https://dmp.cdlib.org/>
- Evaluation: <http://www.nordp.org/assets/resources-docs/programevaluators.pdf>
- The Science of Team Science (Interdisciplinary and Trans-disciplinary Research Teams):
 - http://dccps.cancer.gov/brp/scienceteam/presentations_day1.html

Finding the best 'fit'



Focus On Your Research

- Research Goals
- Take a few minutes to write what you see as your research agenda for the next five years
- What will you be working on in five years? In ten years?



Focus on your field

- What is the current state of the art?
 - What are the top ten researchers in this field doing now?
 - What industries in your area are interested in this type of research?
 - Who funds in your field?
 - What are the key research areas?
 - Who would likely review your proposal at a particular agency?
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- Source, ACS, <http://www.acs.org/content/dam/acsorg/funding/grants/prf/programs/information-for-applicants/Writing%20Competitive%20Proposals.pdf>

Understand the Agency/Industry

- Type/Sector
- Mission
- Policies/Motivations for Giving
- Structure/Review Process

What is the Agency looking for?

- Proposals of high scientific caliber
- Investigator initiated scholarship
- Unique projects
- Projects that build capacity
- Projects that build the scientific workforce pipeline (especially at MSIs and HSIs)

What is the Industry Partner looking for?

- Collaborative funding opportunities (3rd party funding)
- Exchange of expertise
- Unique projects
- Projects that build capacity
- Projects that build the scientific workforce (including exchange and internship opportunities -especially at MSIs and HSIs)
- Return on investment

Can the problem be solved?

- A compelling idea
- Fills a gap in knowledge or fills a need
- Tests a hypothesis/tackles a problem
- Feasible
- ROI
- Important
 - To the field, to them and to you!

Finding a Fit: Targeting a Particular Funding Source

- Collect information (read mission statements, guidelines, previous awards)
- Develop elevator speech
- Develop a white paper (or at least a few paragraphs)
- Contact program (e-mail, telephone, visit)
- Discuss agency interests, your research fit
- Listen

Where do I best fit?

Things to consider before applying:

- Your ROI
- Eligibility- Restrictions
- Deadlines/timelines
- Purpose and Priorities
- Financial Information, recent funding activity/funding rates
- Application and Review Process

Foundation Or Federal

- **Foundation**

- less information about process
- more flexible deadline
- often board of directors makes decision (with staff sometimes)
- may only take weeks

- **Federal**

- clear about process
- deadline firm
- may assign points for sections
- takes about six to nine months for decision
- Reviewers' comments
- tend to be larger and more complex

How to talk with Program Officers:

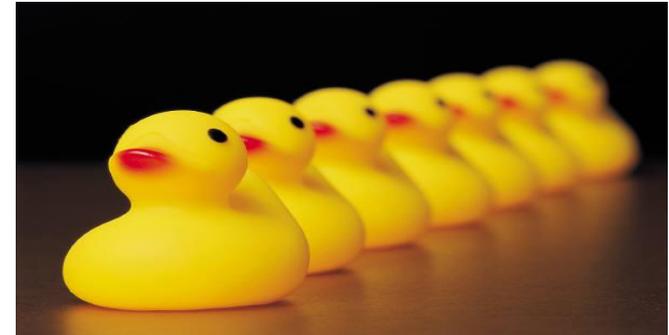
- Ask questions:
 - Is my research a good ‘fit’ with your mission?
 - Is this a priority area for your agency?
 - Are there any special funding opportunities that would fit with this research?
 - Do you have any suggestions for other agencies or foundations that might be a good fit?
- Listen!
- The earlier, the better!
- Don’t be afraid to show your passion!

What they want to know...

- What are your objectives?
- What is your approach?
- Are the right person/Do you have the right team to do it?
- Why is this important?
- If successful, how will society benefit?
- What's in it for us?

Ready to talk to the program?

- Ducks in a row?
- Have you done your homework?
- Have you made an appointment?
- (or is this just your best chance to talk to them?)
- Then email and call!
- But first.....



Elevator speech

- Take a few minutes to write your elevator speech (one paragraph)
- We will take some time to share in small groups



Break



Writing the proposal



Writing the Proposal

- Get examples of successful proposals
- Look at model proposals
- Have colleagues read proposal
- Talk to successful PIs
- Don't be modest

Elements of a Convincing Proposal

- Clear statement of the problem
- Clearly stated hypotheses
- Frank discussion of pitfalls
- Realistic time table/budget/time line
- Thorough literature review
- Can PI do it?

Competitive research proposals:

- Are tailored to the goals of the agency.
- Are ‘doable’ : the research will be feasible and realistic within the budget and timeframes stated.
- Do not promise too much: “Balance ambition with sense” (Howard, NSF Astronomy Div.) (Note: especially for junior faculty/fellowships).
- Don’ t lose them up front: Abstract and introductory sections are clear and straightforward.
- Are clear and well-organized; demonstrate the applicant’ s communication and organizational skills.

Competitive research proposals (cont.)

- Demonstrate knowledge of subject area and literature.
- Contain new and original ideas.
- Have a succinct, focused project plan with appropriate methodology.
- Are focused on achieving the aims and objectives; are not a patchwork of unrelated tasks.
- Address the Big Picture; clearly state why the proposed research is important, significant, and what it will contribute to the field.

Writing Contrasts

- **Grant Writing**

- Sponsor Goals
- Future-oriented
- Project-centered
- Persuasive rhetoric
- Personal tone
- Team-focused
- Strict length constraints
- Accessible language

- **Academic Writing**

- Scholarly pursuit
- Past oriented
- Theme-centered
- Impersonal tone
- Individualistic
- Few length constraints
- Specialized terminology

Follow Directions

- Read the Guidelines!
- Read the Guidelines again!
 - page limit
 - font size
 - sections or headers (formatting)
 - appendices (yes or no)
 - file naming conventions/formats
 - budget limits
 - necessary forms to complete

Following Directions (cont.)

- Use the funder's terminology
- Scoring or evaluation criteria?
- Visual cues (graphics)
- Register ahead for electronic system(s)
 - NIH Commons
 - FastLane

University Process

- Consider time to route proposal through university system
- Get appropriate signoff early!
 - Usually PI, Chair and Dean then sent to university grants office
 - Is there cost share?
 - Space and/or faculty lines?
 - Start date make sense

A few general writing tips.....

- State things simply in common terms.
- Define terms clearly if you must use nonstandard language.
- Avoid ‘jargon’, abbreviations and acronyms
- Use informative subheadings.
- Write in active voice.
 - Jane heard it through the grapevine... or
 - It was heard by Jane through the grapevine...
 - See Grammar Girl:
<http://grammar.quickanddirtytips.com/active-voice-versus-passive-voice.aspx>
 - For this and more

Tips for success...

- State your objectives in the very first paragraph.
- Follow the 'outline' provided in the Solicitation.
- If there is a gap in your expertise, address it!
- Include relevant, quality graphics: many reviewers are visual thinkers!
- A timeline is almost always appropriate and helpful.

Tips for Success (cont.)

- Find collaborators; network
- Look for agency webinars
- Get on a review panel!
- Get funding alerts; conduct your own searches regularly
- Think big, think small, think different
- Treat it like a game (which it is)

Tips for Success (cont.)

- Submit, revise & resubmit!
- Read reviewer comments when available
- Fit research and grant writing into your daily responsibilities
- Find a mentor(s)
- Read successful grants
- Attend workshops

Specific Aim Do's

- Clear
 - Written in nontechnical terms
 - Focused
 - Concise
 - Interesting
 - Simple
 - Align with hypothesis(es)
 - Have them reviewed!
- Source: Deborah Motton PhD; Assistant VCR, UC Merced

Specific Aim Don'ts

- Too many aims (3-4 **max**)
 - Hypothesis is not **CLEARLY** stated
 - Hypothesis is objective restated
 - Omit long term goals
 - Vague, unfocused aims
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- Source: Deborah Motton PhD; Assistant VCR, UC Merced

Things to Avoid

- Hiding key points in lengthy sentences full of jargon
- When you are close to your topic, it is easy to assume that everyone understands it as well as you do.
- Lack of organizing information as RFP requests
- Sloppiness, incorrect grammar, misspellings

To Avoid (cont.)

- Rhetoric and puff
- Weak evaluation section
- Plan time for University process for proposal submission
- Pay attention to deadlines
- Last minute rush
- PLAN AHEAD

Overview of the Peer Review Process



Peer review process: A quick overview

- Understanding the review process can enhance your competitiveness!
- Review *processes* vary considerably by agency, directorate and program.
- There may be multiple levels of review (administrative and scientific) and funding decisions; process can take **months**.

Peer review process: A quick overview (cont.)

- Agencies generally describe (and often evaluate) their processes; e.g.:
 - http://www.nsf.gov/bfa/dias/policy/merit_review/; (NSF)
 - http://www.csrees.usda.gov/business/competitive_peer_review.html (USDA NIFA Proposals)
 - <http://grants.nih.gov/grants/peer/peer.htm> (NIH)
 - -NIH site includes detailed explanation of policies and process; a 'what's new' section; FAQs; Study Section Rosters, and more.
 - -NIH even has video:
<https://www.youtube.com/watch?v=fBDxI6l4dOA&feature=c4-overview-vl&list=PLOEUwSnjvqBlgzR9UIQiWveYW1Rx44A9kt>

Peer review process: A quick overview (cont.)

- Usually managed electronically.
- May or may not be a 'face to face' panel.
 - NSF has instructed programs to use virtual panels for at least 1/3 of proposals (Source: Bola, M NSF IUSE)
- Panels maybe supplemented with ad-hoc reviewers if additional expertise is needed.
- Take advantage of the opportunity to suggest potential reviewers, if offered.

Know how your proposal will be reviewed before you write it

- Proposals that are reviewed by panels may need to be written to a broader audience than proposals that will be reviewed by mail.
- The online descriptions will generally provide considerable information about the process.
- You may learn more from talking with the Program Officer.
- Best way to learn the process: become a reviewer yourself!

NSF Criteria

- Three guiding principles
- Two review criteria
- Five Review elements

- Revised effective January 2013
- See:
http://www.nsf.gov/bfa/dias/policy/merit_review/overview.pdf

NSF Criteria (cont.)

- Guiding Principles:
 - All projects should be of highest quality with potential to advance the frontiers of science;
 - Should contribute to advancing societal goals;
 - Should include meaningful assessment with measurable outcomes
- More at: Revised Merit Review Criteria Resources for the External Community:
http://www.nsf.gov/bfa/dias/policy/merit_review/resources.jsp

NSF Merit Review Criteria

- Intellectual Merit: Encompasses the potential to advance knowledge
- Broader Impacts: Encompasses the potential to benefit society and to contribute to the achievement of specific, desired societal outcomes.
 - For more on Broader Impacts see:
<http://broaderimpacts.missouri.edu>

And join the Broader Impacts Network!

NSF Review Elements

- Potential to advance knowledge and benefit society.
- To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?
- Is the plan well-reasoned, well organized and based on a sound rationale that incorporates assessment?
- How well qualified are investigators and institution to carry out the proposed work?
- Are there adequate resources available to the PI and team? (either at home institution or elsewhere)

NIH Review Criteria

- **Overall Impact:** *Reviewers will provide an overall impact/priority score to reflect their assessment of the likelihood for the project to exert a sustained, powerful influence on the research field(s) involved.*
- **Scored Criteria:**
 - Significance.
 - Investigator(s).
 - Innovation.
 - Approach.
 - Environment.

Grant Review Focus

- Significance – is it important?
- Approach – methods appropriate?
- Evaluation – is it strong?
- Innovation – is it original?
- Investigator – well qualified?
- Environment – institutional help?

NIH Review Criteria, more...

- For an interactive guide to how to apply NIH criteria to ANY type of NIH proposal, geared to reviewers but essential to a top proposal, see:
- https://grants.nih.gov/grants/peer/Review_Criteria_at_a_Glance_MasterOA.pdf

NIH Review Criteria (cont.)

- **Significance:** Does the project address an important problem or a critical barrier to progress in the field? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice be improved?

NIH Criteria (cont.)

- **Investigators:** Are the PD/PIs, collaborators, and other researchers well suited to the project? If Early Stage Investigators or New Investigators, or in the early stages of independent careers, do they have appropriate experience and training? If established, have they demonstrated an ongoing record of accomplishments that have advanced their field(s)? If the project is collaborative or multi-PD/PI, do the investigators have complementary and integrated expertise; are their leadership approach, governance and organizational structure appropriate for the project?

Different language, Similar Criteria

NIH	NSF
Significance	Potential to advance knowledge and benefit society
Approach	Well-reasoned, well organized plan with assessment mechanisms
Innovation	Originality, creativity, potential to transform
Investigators	Qualifications of PI, team, institution
Environment	Adequate resources to carry out activities

Why do scientists become reviewers? (Hint: it isn't for the pay)

- Gain first hand knowledge of the process; learn common proposal mistakes; learn new proposal writing strategies;
- Service to science;
- Keeping current;
- Professional networking.

Who is reviewing your proposal?

- Federal agencies generally have *Peer Review* panels composed of experts, formal, structured process
- State agencies, some federal: may be reviewed by staff.
- Private foundations: Review and funding decisions made by staff and Boards.



Bottom line

- Frame your quality work in the right language for the agency and the RFA!
- Good luck in the review!



You got the grant!

- Now what?



So Now you have your Grant: Things Change

- What if you leave the university?
- What if you want to add a task?
- What if you need to change the research plan?
- What if you over-spend for materials and supplies?
- What if you need to add an international trip

Funded (cont.)

- Keep your program officer informed
- Send stories of successes
- Discuss difficulties and how you plan to solve the problem
- Ask for a no-cost extension before the end date

Questions and Thank you!

