NC State University
Early Career Proposal
Development Program
Sessions

• **Session 1**: Getting Started—Setting Agenda, Identifying Potential Funders and Taking Advantage of Available Resources *(Friday, Feb. 1st from 9 am – noon)*

• **Session 2**: Developing a Competitive Proposal Part 1—Planning Your Proposal *(Friday Feb. 15th from 9 am – noon)*

• **Session 3**: Developing a Competitive Proposal Part 2—Planning Writing the Project Narrative *(Friday March 1st from 9 am – noon)*

• **Session 4**: Developing a Competitive Proposal Part 3—Writing the Other Sections *(Friday March 15th from 9 am – noon)*

• **Session 5**: Developing Synergistic Partnerships *(Friday April 5th from 9 am – noon)*

• **Session 6**: Developing NSF CAREER and Other New Investigator Proposals *(Friday April 19th from 9 am – noon)*

• **Session 7**: Other Essential Knowledge and Wrap-up *(Friday April 30th from 9 am – noon)*
Session 2 Overview

⇒ Assignment Report Back
⇒ Identifying and analyzing funding opportunities
⇒ Understanding the review process
⇒ NCSU’s limited submission process
⇒ Planning your project
⇒ Typical sections of a proposal
⇒ Scheduling your proposal writing
⇒ Writing the Project Summary
Assignment

Identify one or more likely funders

• The program
• The Program Officer
• His/her contact info
Searching for Funding Opportunities
Identifying and understanding funding opportunities

- Identify your research and education interests and goals
- Learn about the types of grants and agencies that fund research in your area
- Learn how to find funding opportunities that fit your goals and interests
- Learn how various agencies fund research and education projects, both solicited and unsolicited
- Understand the agency’s investment priorities/mission
- Develop a long-term strategy for funding your research
Understand the funder

- What kinds of research does the agency fund?
- What is their mission?
- What is their culture?
- What are they trying to accomplish with this program, or suite of related programs?
- How are proposals reviewed?
- Who makes the funding decisions?
- What is the role of the program officer in funding decisions?
Types of university proposals

- Research (basic, applied, mission, applications, contract)
- Educational
- Hybrid research and education
- Small $, few PIs
- Large $, multiple PIs, centers
- Supplements to grants
Trans-agency research funding

- Interdisciplinary, multidisciplinary, trans-disciplinary, transformational research progression--

- For example:
  - NSF/DOE Partnership on Advanced Combustion Engines 2012-2015
  - Joint DMS/NIGMS Initiative to Support Research at the Interface of the Biological and Mathematical Sciences (DMS/NIGMS)
Dear Colleague Letter - Request for ideas about a Mathematics Education Initiative

DATE: May 14, 2012

The National Science Foundation (NSF) in cooperation with the U.S. Department of Education (ED) is interested in input that can inform new activities and programs to support and improve K-16 mathematics education.

The President’s fiscal year 2013 budget to Congress proposes a jointly administrated K-16 mathematics education initiative funded by $30 million from NSF and $30 million from ED. This funding will create a dual-agency initiative on mathematics education that will combine the strengths of NSF and ED to stimulate needed research and development in mathematics education and the use of successful practices and innovations at scale. This initiative will support researchers, practitioners, and institutions with the greatest potential for transformational impact, and provide opportunities for state, local and institutional decision-makers to infuse proven practices into mathematics education. The goal is to have a lasting impact on the learning and teaching of mathematics.

To shape the direction of this initiative, NSF and ED are seeking help from all concerns with K-16 mathematics education. What do you think are the highest priority issues or challenges that need to be addressed in order to improve K-16 mathematics teaching and learning in the country?

The information received in response to this Dear Colleague letter may be used to help shape directions for this initiative. Please submit your ideas by July 1, 2012 by using the online form at http://www.surveymonkey.com/s/k 16 initiative.

Academic Research Funding Strategies, LLC
USDA/NIFA transagency funding

- **With DOE**: Research to advance next generation biofuels and renewable energy technologies (more here).

- **With NSF**: Hydrologic modeling, quality/quantity in agriculture ecosystems; new initiative in ‘phenomics’ in plants. Also see National Robotics Initiative - New Multi-agency Program of NSF, NASA, NIH, and USDA (more here).

- **With NIH and NSF**: Systems approaches in plant and microbial biology, targeting health and well being; genomics and phenomics. Also see The Joint NIH and USDA Workshop on Using Nanotechnology To Improve Nutrition Through Enhanced Bioavailability and Efficacy (more here; and here).

- **With NSF**: STEM education initiative to target middle schools (more here).

- **US Forest Service and NASA** Team up on Climate Change Early Warning System for Forests (more here).

- **USAID and USDA** to Host the International Food Aid and Development Conference (more here).

- **NIH/NICHD and NIFA** Agriculture and Food Research Initiative - Dual Purpose with Dual Benefit: Research in Biomedicine and Agriculture Using Agriculturally Important Domestic Species (more here).
Solicited & unsolicited proposals

• Proposals may be initiated in two general ways by the university researcher:
  • in response to a published solicitation (solicited proposal, RFP, BAA, PA); or
  • initiated by the investigator (unsolicited proposals and white papers).

• ~50% of NSF and ~80% of NIH proposals are unsolicited—learn the process specific to agency

• Review open BAAs for program specific process
Searching for research funding

• Further align research interests with funding agency opportunities by:
  • review past funding solicitations,
  • review agency mission statements,
  • review strategic investment plans, research roadmaps and related documentation.
The Grants.gov web portal serves as a single point of access for all federal agency grant announcements. New funding announcements from federal agency are posted to this site daily, and a range of other features allow subscribing to email funding alerts, linking to agency web sites, and searching for funding among agencies. Grants.gov may link to FedConnect for some agencies, e.g., DOEnergy.
SUBSCRIPTIONS

Subscribe now and receive notifications of new grant opportunity postings and updates on Grants.gov. You do not need to be a registered user of Grants.gov to sign-up for this service.

- **Grants.gov RSS Feed**
  Stay informed about new and updated grant opportunities. Once you see all of the benefits of receiving the Grants.gov RSS feed, you may want to discontinue your email notification subscription. [Click here](#) to unsubscribe from the email notifications.

- **Grants.gov Updates**
  Receive updated information about critical issues, new tips for users and other time sensitive updates as information is available. To unsubscribe from this update you will need to follow the instructions provided in the bottom of the email.

- **All Grants Notices**
  Receive daily notification of all new grant opportunities.

- **Notices Based on Advanced Criteria**
  Select notifications based on specific criteria such as funding instrument type, eligibility or sub-agency.

- **Notices Based on Funding Opportunity Number**
  Select this option to receive notifications based on Funding Opportunity Number (FON). A FON is a...
Solicitation Modifications

• RSS feeds and email alerts also post modifications to program announcements that are made prior to the due dates

• This is particularly important for solicitations with long open periods, or RFPs from mission agencies

• Google search on “RSS feeds at ‘agency name’”

• Grants.gov New/Modified Opps by Agency

• http://www07.grants.gov/rss/GG_OppModByAgency.xml
NSF RSS feeds for funding and reports

RSS Feeds and Podcasts

Click on the icon for the RSS feed to which you want to subscribe. If your browser supports RSS, the feed will be displayed along with an option to subscribe to it. If you use a standalone reader, you may need to drag the RSS icon into your reader or click on the icon and copy and paste the URL from your browser. For more RSS information read the RSS FAQ page.

Current RSS feeds include:

- **The Discovery Files**
  "The Discovery Files" covers projects funded by the government’s National Science Foundation. Federally sponsored research -- brought to you, by you!

Discoveries
- View Discoveries Web page
  You may also be interested in News.

Events
- View Events Web page

Funding
- Program Announcements and Information
  View Program Announcements and Information Web page
NIH RSS feeds and alerts

NIH OFFICE OF THE DIRECTOR (OD)

Office of Communications & Public Liaison (OCPL)
- National Institutes of Health (NIH)
- NIH Research Matters
- NIH News in Health
- NIH Radio
  - @NIHforHealth
  - @NIHComm (Tweets from the NIH Director)
  - @NIHRadio
- Feedback NIH
- NIH Office of the Director YouTube Channel
- Podcast—NIH Research Radio
  - Vodcast—i on NIH
- News
- NIH Research Matters
- NIH News in Health
- NIH Audio Reports

Office of Extramural Research (OER)
- NIH Loan Repayment Programs
- @NIH_OER
  (OER Communications Office)
- @NIHforFunding
  (NIH Guide for Grants and Contracts)
- @NIH_LRP
  (NIH Loan Repayment)
- @RockTalking
  (Tweets from the OER Director)
- Rock Talk Blog
- Podcast—All About Grants
- News Updates
- NIH Funding Opportunities (Notices, PA, RFA)
- OLAW News (Office of Laboratory Animal Welfare)
- hESC Stem Cell Registry
- eSubmission News and Updates
- NIH Regional Seminar Listerv

Quick Links

Office of the Director (OD)

NIH Institutes
- NCI  NIAID  NIDDK  NINDS
- NEI  NIAMS  NIDA  NINR
- NHLBI  NIBIB  NIEHS  NLM
- NHGRI  NICHD  NIGMS
- NIA  NIDCD  NIMH
- NIAAA  NIDCR  NIMHD

NIH Centers
- CC  CSR  NCATS
- CIT  FIC  NCCAM

Related Organizations
NC State’s Funding Resources
Understanding What the Funder Is Looking For
Explicit Proposal Requirements

• Note carefully formatting rules (page limits, fonts, margins, etc.) – these may be in a separate document (NSF GPG, NIH SF424)

• Look for suggested or required sections
  • Make an outline that mirrors solicitation
  • Include checklist of everything that must be addressed, divided by sections; keep this checklist through early drafts

• Note supplementary documents needed
  • Bios, Lists of Current Funding, Letters of support, Facilities and Equipment, etc.
Unspoken Expectations

- Qualifications and experience of PI(s)
- Infrastructure provided by PI’s institution
- Preliminary data
  - Often very important
  - Varies greatly depending on agency, discipline, etc.
- Info sources:
  - Previous awardees
  - Previous reviewers
  - Program officers and previous program officers
Talking to Previous Awardees

• Most previous awardees very generous (unless they will be competing with you for renewal)
• Ask about program reviews, feedback from program officer
• Be aware that programs may evolve and criteria change
• Previous awardees often also reviewers
• May make sense to cite results of previous awardee or forge a connection with previously funded programs
Review Criteria

• Most important part of solicitation!
  • Agency review criteria
  • Program-specific review criteria
• Plan how you will meet each review criterion
• Structure your proposal outline to reflect review criteria
• If you are weak in an area, plan how you will address this
NIH Review Criteria

*Eight Basic Questions Reviewers Ask*

- How high are the intellectual quality and merit of the study?
- What is its potential impact?
- How novel is the proposal? If not novel, to what extent does potential impact overcome this lack? Is the research likely to produce new data and concepts or confirm existing hypotheses?
- Is the hypothesis valid and have you presented evidence supporting it?
- Are the aims logical?
- Are the procedures appropriate, adequate, and feasible for the research?
- Are the investigators qualified? Have they shown competence, credentials, and experience?
- Are the facilities adequate and the environment conducive to the research?
Example: ED Review Criteria

Significance

• Does the applicant provide a compelling rationale for the significance of the project as defined in the Significance of the Project section for the goal under which the applicant is submitting the proposal?

Research Plan

• Does the applicant meet the requirements described in the methodological requirements section for the goal under which the applicant is submitting the proposal?

Personnel

• Does the description of the personnel make it apparent that the Principal Investigator and other key personnel possess appropriate training and experience and will commit sufficient time to competently implement the proposed research?

Resources

• Does the applicant have the facilities, equipment, supplies, and other resources required to support the proposed activities? Do the commitments of each partner show support for the implementation and success of the project?
Five NSF Review Elements

• What is the potential for the proposed activity to:
  • advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
  • benefit society or advance desired societal outcomes (Broader Impacts)?

• To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

• Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?

• How well qualified is the individual, team, or institution to conduct the proposed activities?

• Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?
Intellectual Merit

- **Intellectual Merit**: The intellectual Merit criterion encompasses the potential to advance knowledge (new)
- Previous:
  - How well does your project advance knowledge and understanding?
  - How creative, original or potentially transformative are the concepts?
  - How well conceived and organized is the proposed activity, and will you have sufficient resources?
  - How well qualified is the proposer to conduct the project?
Broader Impacts

• **Broader Impacts**: The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes. (new)

• Previous:
  • How well does the project advance discovery while promoting teaching, training and learning?
  • To what extent will it enhance infrastructure for research and education?
  • How well will it broaden participation of underrepresented groups?
  • Will the results be broadly disseminated?
  • What are the benefits to society?
Understand the Review Process

• Peer review
  • Ad hoc
  • Panel
  • Standing Study Section
• Internal
• Multiple Stage
Before You Start Writing
Planning Your Project

Start with your great idea

↓

Translate it into a project

• What are your objectives and how will they contribute to your long-term research goals?

• Is the scope appropriate for the funding opportunity?

• Do you need collaborators or special resources?

• Does the project fit the funding opportunity and agency?

• Do you have enough publications and/or preliminary data related to the topic?
What is Your Story?

The Need/Motivation
- Goals
- Gaps in Knowledge

New Knowledge
- Hypotheses
- Research Questions

Approach
- Objectives
- How it’s Different

Significance
- Outcomes
- Impact
Exercise

Briefly outline your story and then describe it to your partner

- Motivation
- New Knowledge
- Approach
- Significance
Do I Need Preliminary Data?

• Expectations vary by discipline

• How risky is your research idea?
  • Do you need preliminary data to demonstrate feasibility?

• How strong is your track record?
  • Do you need to demonstrate your mastery of the methodology?

• Are there potential showstoppers that could be explored with some preliminary experiments/calculations?
Have a High Risk/High Payoff Idea?

- But you need funds to generate preliminary data?
- Many agencies have special funding mechanisms for high risk/high payoff projects and/or for small projects that may not have lots of preliminary data
  - NSF EAGER
  - NIH R03, R21
  - ED exploratory projects
Do You Need Institutional Support?

- Types of Institutional Support
  - Letter from Dept. Chair/Head or higher
  - Cost share
  - Assistance with resources
    - Space
    - Logistical support
- Learn the procedures for your institution
  - Usually start with your Dept. Chair/Head and work up
- Start gathering support early!
Do You Need a Collaborator(s)?

- A collaborator can bring needed knowledge, skills or resources to a project
- A collaborator may have a stronger track record or connections with an agency
- Multidisciplinary projects are becoming more common
- Understand characteristics of successful research partnerships
Structuring a Collaboration

• Be sure each collaborator brings specific expertise to the project and has their own well-defined role.

• The budget should be divided according to effort and project needs (discuss division of resources early).

• Discuss expected outputs when planning the project (what papers will you produce and who will be the authors?).

• Each member of the collaboration should benefit.

• Communication is key during the proposal process and after the award.
Plan Ahead

- Identify funding opportunities early
- Do your homework
  - Learn about the agency
  - Understand the program or solicitation
- Plan your proposed project
- Outline your proposal in detail
- Generate a “to do” list
- Start a rough draft writing early
Writing

• Schedule time to write
• Use your very rough draft as a tool to assess what still needs to be done
• Plan on many drafts
• Recruit colleagues to read your drafts and leave time for revisions based on their comments
• Build on previous work
Writing

• Schedule time to write
• Use your very rough draft as a tool to assess what still needs to be done
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• Recruit colleagues to read your drafts and leave time for revisions based on their comments
• Build on previous work
Grantsmanship

Things to keep in mind
It’s not about you…
It’s about the funder

• Understand what the funder is trying to accomplish by giving this grant
• Explain how funding you will help them to accomplish those goals
A Proposal is Not an Academic Article

- Must be persuasive
- Must communicate passion
- Must communicate impact
- Must be easy to understand by readers with various backgrounds
- Must tie research to the goals of the funder
- Focuses on future, not past
- Must inspire confidence in researchers’ abilities and resources
Make Your Proposal Easy to Understand and Easy to Read

• Use figures, flow charts, tables, bullet lists, etc.
• Use heading and subheadings to help reviewers locate the information
• Bold, italics and underlining (used judiciously) can help reviewers find important points
• No tiny fonts or illegible figure labels
You must convince the reviewers…

- This is a project that should be done
  - It supports the goals of the agency and program
  - It will yield significant results
  - It is more important (or cooler or more significant) than other proposed projects
- You (and your team) are the right people to do it
  - You have the skills and resources to be successful
  - You have thought through the project
- And most importantly, you must….
Intrigue the Reviewers
Exercise
Now to the Nitty Gritty…

Writing
Producing the Proposal

• Involve your Office of Sponsored Projects early
• Identify possible collaborators and involve them early
• Work on your budget in parallel with your proposal text
• Finalize your proposal several days before the due date (check with your Office of Sponsored Projects for deadlines)
Scheduling Your Writing

• Work backward from due date
• Check with your pre-award administrators
  • How much time for routing?
  • When do they need the finished proposal?
• Do you need letters of collaboration?
• Do you need input from others?
• Line up editors (when do they need a draft?)
• Work on budget in parallel
• Don’t forget other requirements (Bios, Current & Pending, etc.)
NSF Proposal Elements

• Project Summary (1 page)
• Project Description (typ. 15 pages)
• References Cited
• Supplementary Documents
  • Letters of collaboration
  • DH Letter (for CAREER)
  • Data Management Plan
  • Postdoc Mentoring Plan (if applicable)
• Biosketch (2 pages)
• Current & Pending Form
• Budget
• Budget Justification (3 pages)
• Facilities and Equipment
NIH R01 Proposal Elements

- Project Summary/Abstract
- Public Health Relevance Statement
- Facilities and Equipment
- Specific Research Plan
  - Specific Aims
  - Research Strategy
  - Bibliography
  - Letters
  - Resource Sharing Plan
- Biographical Sketch
- Budget
- Budget Justification
- Additional forms
NEH Fellowship

- Narrative (3 pages)
- Bibliography (1 page)
- Resume (2 pages)
- Appendix
- Letters of Recommendation
ONR Young Investigator Proposal Elements

• Project Summary/Abstract
• Project Narrative (25 pages)
  • Cover Page
  • Table of Contents
  • Technical Approach
  • Project Schedule, Milestones and Deliverables
  • Management approach
  • Bibliography and References Cited
• Research and Related Budget
Writing the Project/Executive Summary

- Requirements vary by agency and program – be sure to check these
- Sets the tone for your entire proposal
- Will be the first (and maybe only) thing your reviewers will read
Purpose of the Project/Executive Summary

• Provides reviewers with a context for your proposed research
• Persuades reviewers of the need for your research
• Assures reviewers of your qualifications
• Assures reviewers of your access to appropriate resources
• Outlines your research objectives
• Describes your expected outcomes
• Demonstrates the significance of your research
Assignment

• Identify and meet with your Director of Research Administration
  • Discuss the services they offer and scheduling of your proposal

• (Advanced): Outline your Project Summary
  • Long-term research goal
  • Project specific goal(s)
  • Significance
  • Hypotheses/research questions/new knowledge
  • How your approach is different
  • Expected outcomes