Jan 27

Proposal Architecture

The Biggest Info Dump of the Program

PROPOSAL PLANNING

What Funding Agencies Look For

- Proposals of high scientific/scholarship caliber
- Investigator-initiated research/scholarship
- **Unique projects**

Grant Preparation

- Obtain an institutional DUNS Number
- Grants.gov institutional registration
- Grant submission system registration (individuals)
  - ORCID iD
  - NSF ID
  - NIH eRA Commons
  - Grants.gov
- Line up institutional resources, commitments
- Meet with research administration/OSR/ORD support staff

Decision to Apply

- **Eligibility**
- Time frame
- Effort
- Appropriateness/fit
- Allowable budget expenses
- Allowable program activities
- Likelihood for success
- ROI

Eligibility

- Organization
  - Type
  - Status
  - Size
- Citizenship/Residency
- New Investigators
- Priority populations
- Diversity
- Re-entry
- Limited Submissions
  - Institutional Limit
  - PI Limit
  - Time Limit

Internal Procedures

- Internal Forms
  - Proposal routing (OSR-1, eProposal, InfoEd PD, OSP Proposal Routing Form, PASS)
  - Conflict of Interest
- Approval Process
- Effort Reporting Considerations
- Contact your sponsored research office/representative well in advance!!

Support Through Good Communication

Dear Geneviève and Pamela:

I will be submitting a proposal in response to the BWF's Career Guidance for Trainees program: http://www.bwfund.org/pages/601/Career-Guidance/. The proposal must be submitted online to BWF's Grant Application System by 3:00 PM CST on Thursday, March 15. I have already started the online application in their system. Because of other commitments and an upcoming surgery/medical leave, my goal is to complete the application and submit on **Monday, March 12** though, so that's our effective deadline and I would greatly appreciate your help being able to meet it.

Here's the application checklist of items I must upload as a single PDF (http://www.bwfund.org/pages/598/Application-Checklist/):

- Proposal Abstract (300 words max, use provided template)
- Proposal (five page limit)
- CV of Applicant
- *CV of Non-Profit/Partner Director (if applicable) → I will not have a partner, so this item is not applicable*
- Letters of Support
- Timeline and Plan for the Proposed Project (two page limit)
- Budget and Justification (use provided template)
- Signature Page (use provided template)

I have completed all of the non-narrative components of the proposal, which I attach here for you to begin your RA and OSR reviews.

- Proposal Abstract (300 words max, use provided template) → this form is just missing the 300 word narrative, but I'm sending the form for you to review
- CV of Applicant → I confirmed with the PO, they do want a full CV and not a biosketch or resume
- Budget and Justification (use provided template) → I also uploaded an Excel worksheet so you can see how I arrived at the salary budget figures; No indirects allowed on the budget
- Signature Page (use provided template) → this will need to be signed in pen and given back to

The narrative components are as follows; I expect to have them all completed by the end of next week:

- Proposal Abstract (300 words max, use provided template)
- Proposal (five page limit)
- Letters of Support (will have these from NIH, Sigma Xi, and Northwestern)
- Timeline and Plan for the Proposed Project (two page limit)

Geneviève, please initiate my proposal in InfoEd. Since there's no system-to-system submission capability, it will simply serve as the routing/approval system. I'm the only personnel listed, so the approval process is just within NUCATS (whew!). And since this is not an NIH/NSF/AHA proposal, I don't think I need to complete a separate OSR-100 form, but let me know if I actually do need to do one.

Please let me know if either of you needs anything more from me at this time.

Proposal Application Information

- Proposal Information Web Pages
  - UofM DRI Useful Information for Applications
  - MI Frequently Required Proposal Documents and Data
  - IU Institutional Information
  - Lurie Children's OSP Fast Facts
  - UCMerced SPO Institutional Information for proposals
  - Notre Dame Research Resource Library
- Types of Information
  - DUNS#
  - Animal Assurance #
  - Applicant Organization
  - F&A Rates
  - Fringe Benefit Rates
  - Congressional District
  - FEIN
  - IRB Registration Number

Due Diligence

- Read agency Mission Statement
- Review funder's web site, look for Priority Areas
- Awards made dBs
- Old program solicitations
- Read sample proposals (FOIA, use with caution!)
- Annual reports
- Search patents
- Published literature
- Determine if Letter of Intent/Inquiry (LOI) is required
- Investigate whether anyone from your institution is a previous recipient of an award
- Interact with Program Officials
- Identify appropriate unit for funding consideration

Proposal Guidelines

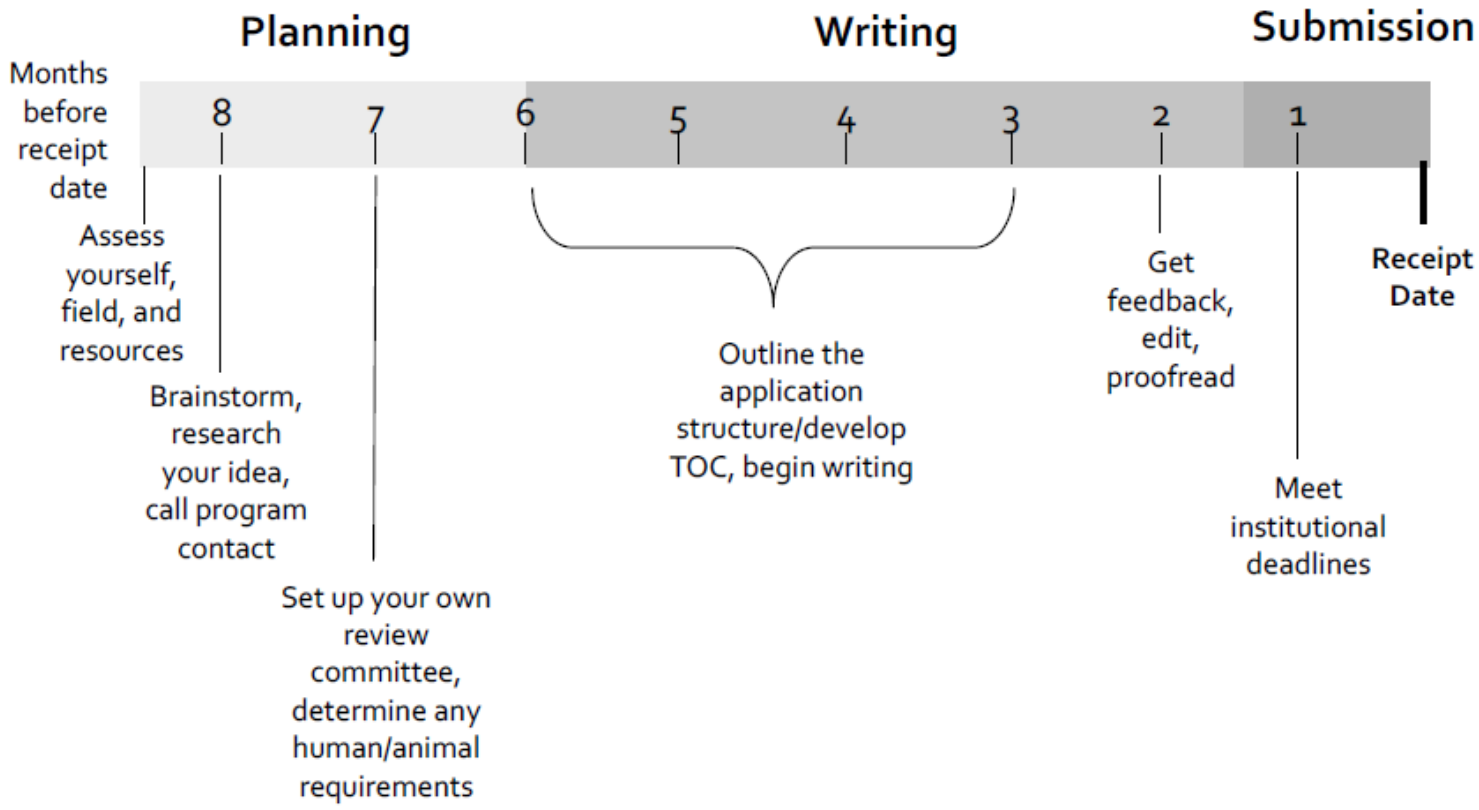
- Keep the original funding announcement, register for addendums
- Read ALL proposal and form instructions
- Recognize funding announcement key elements
- Note what is not eligible for funding
- Note submission deadline and time
- Use correct form package (Grants.gov)
- Online vs paper submission
- Formatting (e.g. font size/style, margins)
- Read and understand review criteria
- Program Official contact information
  - Submit questions
  - Attend grant webinar/workshops
- Follow proposal instructions EXACTLY…

Follow Instructions!

This correspondence is in regard to the proposal which was submitted on behalf of [redacted] in response to subject solicitation. Pursuant to the provisions in the solicitation, we are removing pages that were included in the technical proposal in excess of the page limitation of 160 pages.

The information regarding the page limitation can be found in Attachment 1, Packaging and Delivery of the Proposal. The page limit was indicated as 150 pages in the original solicitation and then increased to 160 pages by Amendment 4, dated December 5, 2008. Attachment 1 also stated that "pages in excess of this limitation will be removed from the proposal and will not be provided to the reviewers to be read or evaluated."

Timeline



REVIEW PROCESS

Who Reviews

- Each funding agency has its own review process
- Federal agencies generally have formalized review panels of experts—peer review
- State agencies generally use staff as reviewers
- Foundations generally rely on staff and boards for review and funding decisions

“Heilmeier Catechism”

- 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 is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- What are the mid-term and final “exams” to check for success?

Review Criteria

Mandatory criteria reviewers consider

- Reviewers are provided a proposal scoring/rating form and instructed to review proposals based on how well the mandatory review criteria are met
- Recent NSF criteria emphasizes transformative and interdisciplinary research
- Recent NIH criteria emphasize clinical, interdisciplinary, and translational research; add'l components added for rigor & transparency and clinical trials

NIH Proposal Review

- The most transparent and detailed process of all agencies
  - Review Criteria & Considerations
  - Scoring
  - Process
- Compare/Contrast with other federal agencies

NIH Review Criteria & Considerations

- Scored (formerly Core) Review Criteria
  - 5 criteria scored individually and considered in final Overall Impact score
- Additional Review Criteria
  - Not scored individually, but considered in final Overall Impact score
- Additional Review Considerations
  - Not scored individually and not considered in Overall Impact score

Great alignment of application structure with review criteria

Scored Review Criterion: 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? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field? **Is the prior research that serves as the key support for the proposed project rigorous?***

***Previously "Is there a strong scientific premise for the project?"**

Scored Review Criterion: Approach

- Are the overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility and will particularly risky aspects be managed?
- Have the investigators presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed? (Design)
- **Have the investigators included plans to address weaknesses in the rigor of prior research that serves as the key support for the proposed project? (i.e., rigor of prior research)**
- Have the investigators presented adequate plans to address relevant biological variables, such as sex, for studies in vertebrate animals or human subjects? (Sex as a biological variable)
- If the project involves human subjects and/or NIH-defined clinical research, are the plans to address: 1) the protection of human subjects from research risks, and 2) the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (exclusion) of individuals of all ages (including children and older adults), justified in terms of the scientific goals and research strategy proposed? (Clinical research)

Scored Review Criterion: Innovation

- Does the application challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Are the concepts, approaches or methodologies, instrumentation, or interventions novel to one field of research or novel in a broad sense? Is a refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions proposed?

Scored Review Criterion: Investigator

- 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?

Scored Review Criterion: Environment

- Will the scientific environment in which the work will be done contribute to the probability of success? Are the institutional support, equipment and other physical resources available to the investigators adequate for the project proposed? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements?

Additional Review Criteria

- Protections for Human Subjects
- Inclusion of Women, Minorities, and Children
- Vertebrate Animals
- Biohazards
- Resubmission/Renewal/Revision Applications

Review Criteria and Mission Linkage

- Funders don't exist to fund any one research program. They exist to fulfill their own missions by investing in investigators and projects that realize their priorities. So, when developing a grant, it's critical to tailor the proposal to the unique interests and priorities of the funder. Every solicitation relates in some way to the funder's overall mission. And in case that's still not enough guidance…because the funders tell us so!:

Review Criteria and Mission Linkage

- The NIH is quite specific about relevance to the NIH's mission, from https://grants.nih.gov/grants/peer-review.htm:
  - "The mission of the NIH is to support science in pursuit of knowledge about the biology and behavior of living systems and to apply that knowledge to extend healthy life and reduce illness and disability. Applications submitted in support of the NIH mission are evaluated for scientific and technical merit through the NIH peer review system."
- As part of the Project Narrative that accompanies the Abstract, since 2016 *all* proposers are required to:
  - "…describe the relevance of this research to public health. For example, NIH applicants can describe how, in the short or long term, the research would contribute to fundamental knowledge about the nature and behavior of living systems and/or the application of that knowledge to enhance health, lengthen life, and/or reduce illness and disability."
- Note the parallel to the exact same language as the NIH's mission:
  - "NIH's mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce the burdens of illness and disability."
- Likewise, NSF's Guiding Principles:
  - "All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge. NSF projects, in the aggregate, should contribute more broadly to achieving societal goals."
- And the NSF's two Merit review Criteria for *all* grant review:
  - Intellectual Merit: This criterion encompasses the potential to advance knowledge
  - Broader Impacts: This criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes

PROPOSAL COMPONENTS

Reviewer-centric Proposals

- Do not write the application for yourself…unless you are going to fund it yourself!
- Reviewers are never wrong/never right, they simply provide an assessment of the material provided in your application

Organization and Presentation

- Organization = happy reviewers = $
- Craft a title that is informative
- Use all recommended organization terminology, section headers, order, and formatting
  - NSF will now have consistent formatting across all solicitations!
- Be consistent!!!
- Detailed Table of Contents
- Be familiar with page layout features of software program

Organization and Presentation

- Design tables and figures that are self-explanatory
- Put contextual information on the left, to familiarize the reader; put new information on the right, to intrigue the reader
- Use topic sentences at the beginning of paragraphs, especially at the beginning of each new section

Empower the Reviewer

- Good proposals that are easy to evaluate are more likely to be funded than great proposals that are difficult to evaluate.
- Recognition is a powerful decision-making tool
- Search that relies on cue recognition makes fewer demands on memory and computational skills than a search for alternatives
- Especially true under time pressure, when individuals are apt to use simple strategies to solve problems and make decisions
- Enable reviewers to quickly locate your responses to the review criteria

Write the Review for the Reviewers

- The **significance** of the results is…
- The **feasibility** of this approach is demonstrated by…
- The **outcome** of these experiments will be…
- The **innovation** of this project is defined by…
- The potential for **transformation** by this research is evident by…
- Our **team** is especially well-qualified to undertake this project because…
- Our **environment** contributes significantly to the aims of this project in that…
- This proposal will **advance knowledge**/have a **broader impact** by…

Agency Proposal Guides

- NIH How to Apply - Application Guide
- SF424 (R&R) Application and Electronic Submission Information (NIH and other PHS agencies)
- NSF PAPPG (Proposal and Award Policies and Procedures Guide)
- NASA Proposers' Guidebook
- DOE Grants Policy and Guidance
- Individual Solicitations

Proposal Component List (pg 1 of 3)

- Letter of Intent
- Title
- Cover Letter
- Face/Cover Page
- Abstract (+Relevance Statement)/Project Summary
- Senior/Key Personnel
- Table of Contents
- Budget and Budget Justification
- Current & Pending Support
- Biosketches
- Collaborators & Other Affiliations Information
- Facilities, Equipment & Resources
- References Cited

Proposal Component List (pg 2 of 3)

- Research Plan/Project Description Section
  - Introduction (Resubmission-Revision)
  - Specific Aims/Goal & Objectives Section
  - Research Strategy/Project Plan
  - Progress Report Publication List (renewals only)
- Protection of Human Subject Section
  - Protection of Human Subjects
  - Data Safety Monitoring Plan
  - Inclusion of Women and Minorities
  - Inclusion of Across the Lifespan
- Clinical Trials

THE UNIVERSITY OF MEMPHIS
Research & Innovation

Proposal Component List (pg 3 of 3)

- Other Research Plan Section
  - Vertebrate Animals
  - Select Agent Research
  - Multiple PI/PD Leadership Plan
  - Consortium/Contractual Arrangements
  - Letters of Support
  - Resource Sharing Plan
  - Authentication of Key Biological and/or Chemical Resources
- Management Plan
- Postdoc Mentoring Plan
- Data Management Plan
- Appendix(ces)

Components by Importance

1. Specific Aims/Objectives
2. Abstract/Summary
3. Research Plan
4. Biosketches
5. Letters
6. Budget
7. Resources
8. Everything else

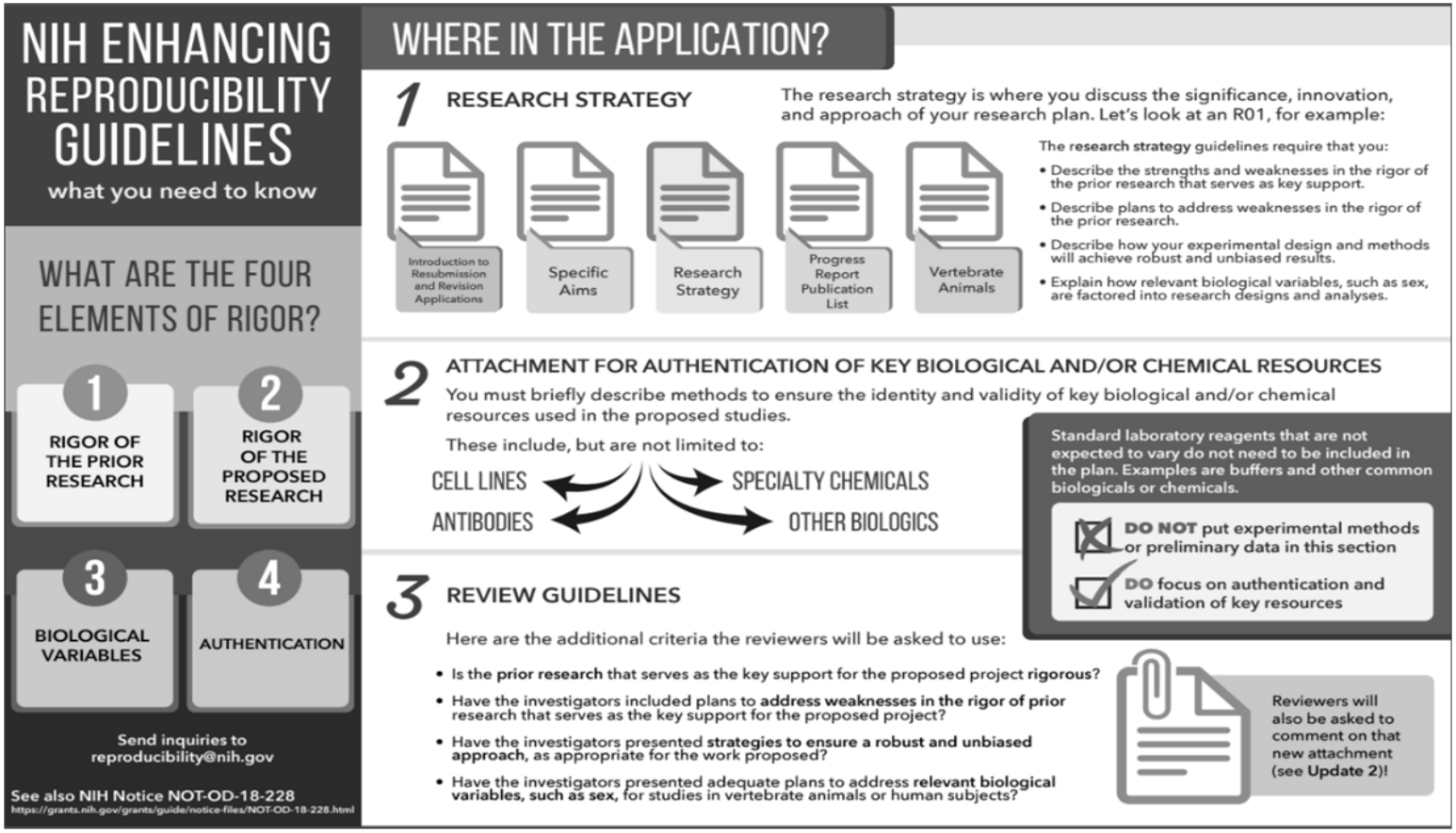
NIH “New” Proposal Structure

- Shortened page limits
- Alignment of the application structure with peer review criteria
- Changes to three sections of the application
  - Research Plan, which includes the new “Research Strategy” section
  - Biosketches
  - Resources

NIH Proposal Component List

- ❑ SF424 (R&R) Form (Cover)
- ❑ Project Summary/Abstract
- ❑ Project Narrative
- ❑ References Cited
- ❑ Facilities & Other
- ❑ Resources
- ❑ Equipment
- ❑ Project/Performance Site
- ❑ Locations
- ❑ Senior/Key Personnel
- ❑ Biosketches
- ❑ Budget
- ❑ Research Plan
  - ❑ Introduction to Application (resub/revision)
  - ❑ Specific Aims Section
  - ❑ Research Strategy
  - ❑ Resource Sharing Plan
  - ❑ Authentication of Key Biological and/or Chemical Resources
  - ❑ Appendix
- ❑ Human Subject & Clinical Trials Forms
- ❑ Authentication Attachment
- ❑ Assignment Request Form

NIH Enhancing Reproducibility Guidelines



Enhancing Reproducibility in NIH Applications: Resource Chart

Enhancing Reproducibility in NIH Applications: Resource Chart

NIH Grants Policy Website: http://grants.nih.gov/reproducibility/index.htm
NIH Website: https://www.nih.gov/research-training/rigor-reproducibility

4 AREAS OF FOCUS	WHAT DOES IT MEAN?	WHERE SHOULD IT BE INCLUDED IN THE APPLICATION?
Rigor of the Prior Research	A careful assessment of the **rigor of the prior research** that serves as the key support for a proposed project will help applicants identify any weaknesses or gaps in the line of research. Describe the strengths and weaknesses in the rigor of the prior research (both published and unpublished) that serves as the key support for the proposed project. Describe plans to address weaknesses in the rigor of the prior research that serves as the key support for the proposed project *See related FAQs, blog post	**Research Strategy** ➢ Significance ➢ Approach
Scientific Rigor (Design)	**Scientific rigor** is the strict application of the scientific method to ensure robust and unbiased experimental design, methodology, analysis, interpretation and reporting of results. Emphasize how the experimental design and methods proposed will achieve robust and unbiased results. *See related FAQs, blog post, examples from pilots	**Research Strategy** ➢ Approach
Biological Variables	**Biological variables**, such as sex, age, weight, and underlying health conditions, are often critical factors affecting health or disease. In particular, sex is a biological variable that is frequently ignored in animal study designs and analyses, leading to an incomplete understanding of potential sex-based differences in basic biological function, disease processes and treatment response. Explain how relevant biological variables, such as the ones noted above, are factored into research designs, analyses, and reporting in vertebrate animal and human studies. Strong justification from the scientific literature, preliminary data or other relevant considerations must be provided for applications proposing to study only one sex. *See related FAQs, blog posts, article	**Research Strategy** ➢ Approach
Authentication	**Key biological and/or chemical resources** include, but are not limited to, cell lines, specialty chemicals, antibodies and other biologics. Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources used in the proposed studies. These resources may or may not have been generated with NIH funds and: • may differ from laboratory to laboratory or over time; • may have qualities and/or qualifications that could influence the research data; • are integral to the proposed research. The authentication plan should state in one page or less how you will authenticate key resources, including the frequency, as needed for your research. Note: Do not include authentication data in your plan. *See related FAQs, blog post, examples	**Other Research Plan Section** ➢ Include as an attachment ➢ Do not include in the Research Strategy.

****This chart is based on general instructions for research grant applications submitted for January 25, 2019 due dates and beyond. It should only be used as a guide. For all applications, please read the applicable Funding Opportunity Announcement (FOA) & Application Guide for specific instructions.**

Rigor & Transparency: Revisions to the Application Guide Summary

Form	Section	Heading	Previous language	Current language
Research Plan	Research Strategy	Significance	Describe the scientific premise for the proposed project, including consideration of the strengths and weaknesses of published research or preliminary data crucial to the support of your application.	Describe the strengths and weaknesses in the rigor of the prior research (both published and unpublished) that serves as the key support for the proposed project.
Research Plan	Research Strategy	Approach	Not Applicable	Describe plans to address weaknesses in the rigor of the prior research that serves as the key support for the proposed project.
Human Subjects and Clinical Trials Information	Section 2 – Study Population Characteristics	2.4 Inclusion of Women, Minorities, and Children	2. Inclusion of Children [References to the Inclusion of Children in Clinical Research policy]	2. Inclusion Across the Lifespan [References to Inclusion of Children replaced with Inclusion Across the Lifespan]

NSF Proposal Component List

- ❑ Cover Sheet
- ❑ Project Summary
- ❑ Table of Contents
- ❑ Project Description
  - ❑ Introduction*
    - ❑ Intellectual Merit
  - ❑ Broader Impacts
  - ❑ Results from Prior NSF Support
    - ❑ ▪ Intellectual Merit
    - ❑ ▪ Broader Impacts)
  - ❑ Management Plan
  - ❑ Evaluation/Assessment Plan
  - ❑ Summary and Future Directions*
- ❑ References Cited
- ❑ Biographical Sketch(es)
- ❑ Proposal Budget or Budget and
- ❑ Budget Justification
- ❑ Current and Pending Support
- ❑ Facilities, Equipment and Other Resources (FER)
- ❑ Special Information and Supplementary Documentation
  - ❑ Data Management Plan
  - ❑ Postdoctoral Researcher Mentoring Plan
  - ❑ Letters
- ❑ List of Suggested Reviewers or Reviewers Not to Include
- ❑ Collaborators & Other Affiliations Information
- ❑ Appendices

Letter of Intent

- Facilitates productive discussion program officials
- Assists review planning
- Do one even if not required
- Overview of research project
  - Significance w/ mission relevance
  - Innovation
  - Approach
  - Personnel and disciplines

Title

- Craft a title that is informative, descriptive
- Focus on problem you're trying to solve
- Reflects the content of the full proposal
- Makes reviewer want to read further
- Put some key words together in a way that they will make sense
- Often a character or word length limit
- Resubmission/renewal application should normally have same title as original
  - If specific aims of the project significantly changed, choose a new title that accurately describes the project
  - Indicate the change in the application form as appropriate and make note in the cover letter

Cover Letter

- Program information
  - Grant title
  - Program name and number
  - Disciplines involved
- Directs proposal to appropriate section of funding agency for review and funding consideration
- Reviewers
  - Suggest expertise needed for appropriate review
  - Recommend people who should not review due to possible conflict of interest

NIH Assignment Request Form

- Replaces including an assignment or review request in a Cover Letter
  - Requests for assignment to (or not to) specific ICs
  - Requests for assignment to (or not to) specific review groups
  - Types of expertise needed to review your application
  - Brief lists of people who might be in conflict with your application (and why)
- Use a Cover Letter only for:
  - Reasons why your application may have been submitted late
  - Information about any videos you may provide as post-submission materials
  - Statement that proposed studies will generate large-scale human/nonhuman genomic data
  - Special agency approvals, such as $500k or conference grant approvals
  - Special information about subaward budgets

NSF List of Suggested Reviewers or Reviewers Not to Include

- An single-copy document
- Proposers may include a list of suggested reviewers (including email address and organizational affiliation) who they believe are especially well qualified to review the proposal
- Proposers also may designate persons they would prefer not to review the proposal, indicating why

Table of Contents

- Sections listed in TOC in the order in which they appear
- Page numbers
- Detailed section headings

Abstract/Project Summary

- Summary of the proposed work
- No past accomplishments
- Broad, long-term goals and specific aims
- Relevance of project/program to agency mission
- Approach and methods for achieving the goals
- Address all review criteria
- Usually one page or less
- In the public domain if proposal funded
- Write last !!

NIH Abstract

- Limit length to 30 lines or less of text
- Include the project's broad, long-term objectives and specific aims
- Include a description of the research design and methods for achieving the stated goals
- Do NOT include proprietary or confidential information, or trade secrets
- Write in plain language, so even a non-scientist can understand the importance of the project
- Will be viewable to the public on RePORTER if the application is funded.

NIH Project Narrative

- Not actually a narrative at all!
- Specific to HHS agencies
- Describe relevance of the proposed research project to public health
  - Succinct, no more than 2-3 sentences long
  - In plain language understandable by a general, lay audience
  - Updated guidance in 2016: "…describe the relevance of this research to public health. For example, NIH applicants can describe how, in the short or long term, the research would contribute to fundamental knowledge about the nature and behavior of living systems and/or the application of that knowledge to enhance health, lengthen life, and/or reduce illness and disability."
- Also made available in RePORTER, appearing at the end of the project abstract

NSF Project Summary

- Summary of the proposed work
- No past accomplishments
- Broad, long-term goals and specific aims
- Relevance of project/program to agency mission
- Approach and methods for achieving the goals
- Separate sections/boxes for
  - Overview
  - Intellectual Merit
  - Broader Impact
- 1 page
- An abstract based on the Project Summary in the public domain if proposal funded
- Write last

Resources

- NSF Facilities, Equipment & Other Resources
  - Ways in which the proposed studies will benefit from unique features of the Scientific/Program environment
    - Subject populations; Access to specialized equipment; Useful collaborative arrangements
- NIH Resources (Facilities and Other Resources in some RFAs)
  - A description of how the scientific environment will contribute to the probability of success of the project, unique features of the environment
  - For Early Stage Investigators, the institutional investment in the success of the investigator (e.g. resources, classes, etc.)
- Can develop boilerplate text, but ALWAYS customize

Biographical Sketch

- Biosketch
- Not a CV nor a resume
- Conveys information about the qualifications, productivity, and the role of personnel involved in **the proposed project**
- Required for all Key/Senior Personnel
- Format varies at each agency

NIH Biosketch

- Education & Training
- Personal Statement
- Positions and Honors
- Contribution to Science
- Complete List of Published Work in MyBibliography
- Additional Information: Research Support and/or Scholastic Performance

NIH Biosketch

Personal Statement

- Briefly describe why you are well-suited for your role(s) in this project. The relevant factors may include: aspects of your training; your previous experimental work on this specific topic or related topics; your technical expertise; your collaborators or scientific environment; and/or your past performance in this or related fields. (Customize for every proposal)
  - New additional instructions that may or may not apply to you
- You may cite up to four publications or research products that highlight your experience and qualifications for this project. Research products can include audio or video products; conference proceedings such as meeting abstracts, posters or other presentations; patents; data and research materials; databases; educational aids or curricula; instruments or equipment; models; protocols; and software or netware.

NIH Biosketch

Contribution to Science

- Briefly describe up to five of your most significant contributions to science. While all applicants may describe up to five contributions, graduate students and postdoctorates are encouraged to consider highlighting two or three they consider most significant. Descriptions may include a mention of research products under development, such as manuscripts that have not yet been accepted for publication.
- Each contribution should be no longer than one half page, including citations. These contributions do not have to be related to this project.
- For each contribution:
  - Indicate the historical background that frames the scientific problem; the central finding(s); the influence of the finding(s) on the progress of science or the application of those finding(s) to health or technology; and your specific role in the described work.
  - You may cite up to four papers accepted for publication or research products that are relevant to the contribution.
  - Research products can include audio or video products; conference proceedings such as meeting abstracts, posters or other presentations; patents; data and research materials; databases; educational aids or curricula; instruments or equipment; models; protocols; and software or netware.
  - These citations do not have to be authored by you.
  - You may provide a URL to a full list of your published work. This URL must be to a Federal Government website (a .gov suffix). NIH recommends using My Bibliography. Providing a URL to a list of published work is not required, and reviewers are not required to look at the list.

NIH Biosketch Guidance

Peer-Reviewed Publications and Other Research Products

- Non peer-reviewed articles and research products can be cited in the Personal Statement along with the peer-reviewed publications.
- Interim research products (e.g., preprints) can be cited anywhere other research products are cited.
- NIH requires a PMCID for works that apply under the NIH Public Access Policy and are authored by the applicant or arise from an applicant's NIH award.
- No specific style guide for citations is required. SciENcv formats citations from My Bibliography using the National Library of Medicine (NLM) Style Guide.
- To save on space for the Personal Statement or Contributions to Science sections, applicants may use 'et al' in lieu of listing all authors in a citation.
- Citations can be reused among the Personal Statement or Contributions to Science sections.
- Manuscripts being prepared or under peer review can be described in the Personal Statement or the Contributions to Science narrative sections, (e.g. "I am preparing a manuscript for Journal on my work about X"), but not cited.
- Publications noted in a My Bibliography account can be used to auto-populate the Personal Statement or the Contributions to Science sections.

NIH Biosketch Guidance

Contributions to Science

- For guidance on Contributions to Science, contact the Program Director at the NIH institute/center (I/C) supporting or most likely to support your award.
- Up to five Contributions to Science are allowed.
- Contributions to Science can include non-applicant authored publications and research products.
- Publications and research products can be re-used within the same Biosketch among the Contributions to Science narratives.
- Posters and presentations are considered non-publication research products.
- There is no preferred order as to the Contributions to Science.
- Each contribution should be no longer than one half page including citations.
- Use My Bibliography to auto-populate the publications and research products for Contributions to Science.
- Databases and data/research materials are not required to be publicly accessible and can be included in the Contributions to Science sections.
- Listen to the podcast (or read the transcript): "Understanding NIH's Biosketch Requirements" for more insight as to the Contributions to Science section.

NIH Biosketch

Advice for early career scientists filling out their scientific contributions

- It is a little early to tell how each discipline will judge its new scientists. You might want to consult with your colleagues who serve as reviewers in your area of science.
- In general, reviewers base their expectations for contributions based on the seniority of the person filling out the biosketch. A scientist with one publication may want to summarize the key finding of the paper and its importance in a short contribution. Scientists with no publications may wish to provide a contribution describing their efforts on other peoples' papers and projects (e.g., I used this method, I conducted the literature review for this paper, I care for all the animals in this lab, etc.).
- If a new scientist has no actual research or thesis experience, they might just want to list one contribution about their training to date.

NSF Biosketch

- Professional Preparation
- Appointments
- Products
- Synergistic Activities

NSF Biosketch

- **Products:** A list of: (i) up to five products most closely related to the proposed project; and (ii) up to five other significant products, whether or not related to the proposed project. Acceptable products must be citable and accessible including but not limited to publications, data sets, software, patents, and copyrights. Unacceptable products are unpublished documents not yet submitted for publication, invited lectures, and additional lists of products. Only the list of 10 will be used in the review of the proposal.
  - Each product must include full citation information including (where applicable and practicable) names of all authors, date of publication or release, title, title of enclosing work such as journal or book, volume, issue, pages, website and Uniform Resource Locator (URL) or other Persistent Identifier.
  - If only publications are included, the heading "Publications" may be used for this section of the Biographical Sketch.

NSF Biosketch

- **Synergistic Activities:** A list of up to five distinct examples that demonstrate the broader impact of the individual's professional and scholarly activities that focuses on the integration and transfer of knowledge as well as its creation. Examples should be specific and could include, among others: innovations in teaching and training (e.g., development of curricular materials and pedagogical methods); contributions to the science of learning; development and/or refinement of research tools; computation methodologies and algorithms for problem-solving; development of databases to support research and education; broadening the participation of groups underrepresented in STEM; and service to the scientific and engineering community outside of the individual's immediate organization. **Examples with multiple components are not permitted.**

NSF Biosketch

Dear Colleagues:

Please be advised that the National Science Foundation (NSF) has designated the National Institutes of Health's SciENcv (Science Experts Network Curriculum Vitae) as an NSF-approved format for submission of biographical sketch(es) and is encouraging its use to prepare a biographical sketch for inclusion in proposals to NSF.

In accordance with the current Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 19-1), a biographical sketch (limited to two pages) is required for each individual identified as senior personnel on a proposal, and a separate biographical sketch PDF file, or other NSF-approved format, must be uploaded in FastLane for each designated individual (see PAPPG Chapter II.C.2.f.). These biographical sketch and file format requirements also apply to NSF proposals submitted through Research.gov and Grants.gov.

Use of an NSF-approved format aims to reduce administrative burden and improve efficiencies by providing proposers with a compliant and reusable way to maintain this information for subsequent proposal submissions to NSF, while also ensuring that the information is submitted in a searchable composition.

Beginning with the next iteration of the PAPPG (expected to be implemented in January 2020), NSF will only accept PDFs for biographical sketches that are generated through use of an NSF-approved format. A description of NSF-approved format(s) will be posted on the NSF website when the PAPPG is issued. A draft version of the PAPPG was published in the Federal Register for public comment. The deadline for submitting comments is COB July 29, 2019.

Multiple training resources are available on the SciENcv website. The following website resources may be of assistance to proposers preparing a biographical sketch using the SciENcv format:

- SciENcv Background
- YouTube Video: SciENcv Tutorial
- YouTube Video: Integrating with ORCID
- SciENcv Help

We encourage you to share this information with your colleagues. If you have IT system-related questions, please contact the NSF Help Desk at 1-800-381-1532 or rgov@nsf.gov. Policy-related questions should be directed to policy@nsf.gov.

Regards,
National Science Foundation

Collaborators & Other Affiliations Information

- Spreadsheet document that requires each senior project personnel to provide information regarding collaborators and other affiliations
  - Collaborators & Other Affiliations
  - Collaborators and Co-Editors
  - Graduate Advisors and Postdoctoral Sponsors
  - Thesis Advisor and Postgraduate-Scholar Sponsor
- Info previously provided in Biosketch

Budget

- Financial description of the project with supporting notation or narrative
- Presents proposal/program in a financial sense
- Reflects how resources will be allocated to accomplish the research described
- All budget items should relate to project/program objectives
- Budget for each year of support requested, Cumulative budget
- Amounts requested for each budget line item should be documented and justified in the Budget Justification
- Permissible costs: necessary, reasonable, allocable, and allowable under the applicable cost principles

Budget Justification

- Use categories developed by agency: In same order as on Budget form
- Relate line items to program objectives
- Reasonable requests
- Include all amounts/items asked of funder
- Make sure totals add up b/t Budget and Justification
- Include all amounts/items to be paid for by other sources, including donations and in-kind support
- Carefully justify
- Explain overlap with other sources of funding
- Cost share judiciously

NSF Current & Pending Support

- All current project support regardless of source for each investigator and other senior personnel
  - Including internal funds allocated toward specific projects
- All proposed projects or activities requiring a portion of time of the PI and other senior personnel, even if they receive no salary support
- Total award amount for the entire award period covered (including indirect costs)
- Number of person-months per year
- Concurrent submission of a proposal to other organizations will not prejudice its review by NSF

Proposal Narrative

- An outline of the general plan of work, including the broad design of activities to be undertaken.
- Provide a clear description of experimental methods and procedures. Proposers should address what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful.
- The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified. These issues apply to both the technical aspects of the proposal and the way in which the project may make broader contributions.

Proposal Narrative Comparison

NIH RESEARCH PLAN

- Introduction to Application (resub/revision)
- Specific Aims Section
- Research Strategy
  - Significance
  - Innovation
  - Approach
    - Preliminary Studies for New Applications/ Progress Report for Renewal-Revision Applications
  - Investigators & Environment*
  - Overall Impact & Future Directions*
- Resource Sharing Plan
- Authentication of Key Biological and/or Chemical Resources

NSF PROJECT DESCRIPTION

- Introduction*
- Intellectual Merit
  - Goals and Objectives*
  - Methods*
  - Expected Results/Deliverables*
  - Limitations & Alternatives*
  - Timeline/Resources*
- Broader Impacts
  - Goals and Objectives*
  - Activities*
  - Deliverables*
  - Limitations & Alternatives*
  - Timeline/Resources*
- Results from Prior NSF Support
  - Intellectual Merit
  - Broader Impacts
- Management Plan
- Evaluation/Assessment Plan
- Summary and Future Directions*

NIH Research Plan Comparison

OLD RESEARCH PLAN (25pgs)

- Introduction to Application
- Specific Aims Section
- Background and Significance
- Preliminary Studies/Progress Report
- Research Design and Methods

NEW RESEARCH PLAN

- Introduction to Application (1pg)
- Specific Aims Section (1pg)
- **Research Strategy (12pgs)**
  - Significance
  - Innovation
  - Approach
    - ✓ Preliminary Studies (new applications)
    - ✓ Progress Report (renewalrevision applications)
  - Investigators & Environment*
  - Overall Impact & Future Directions*

**Not required sections*

NIH Research Plan

- NIH Research Plan

1. Introduction to Application (resub/revision)
2. Specific Aims Section: Hypothesis and Aims
3. Research Strategy (bulk of proposal narrative)
   - Significance
   - Innovation
   - Approach
     - Preliminary Studies for New Applications/Progress Report for Renewal-Revision Applications
   - Investigators & Environment*
   - Overall Impact & Future Directions*

**Not required sections*

Introduction to Application

- Resubmission
- Revision
- Address past critiques—no rebuttals!
- Progress made
  - Don’t emphasize anything about why the proposal wasn’t funded previously
  - Don’t include initial score
- 1 page

Specific Aims Section

- Most important section of the proposal, most difficult to write
- Write first, finish last
- Can serve as a pre-proposal
- Must engender enthusiasm for your research
- Start broad, move towards specificity
- Cohesive, highly focused
- Includes
  - Hypothesis/Need Statement
  - Specific Aims/Objectives
- 1 page
  - Separate 1 pg component of NIH Research Plan, not included in 12-pg Research Strategy

Specific Aims/Goals & Objectives

- Specific research objectives –what you plan to do
- Collectively test the hypothesis/address need
- Logic flow one to the next, but one must not be absolutely dependent on the outcome of another
- Determine and predict the content and specific types of experiments to be conducted
- Lead to results upon which you can draw conclusions
- Attainable in the stated time frame, not long-term goals
- Brief and clear: 2-5…

Aims at the Beginning

"After placing the first four aims on paper a first time grant writer should consider choosing one and develop it into an entire grant."

Author unknown

NIH Research Strategy

- Research Strategy
  - Significance
  - Innovation
  - Approach
    - Preliminary Studies/Progress Report
  - Investigator & Environment*
  - Overall Impact & Future Directions*
  - Provide reviewers with all info to review grant AND get excited about your research
- 12 pages (6 pgs for R03, R13, R25)

**Not required sections*

NIH Research Strategy

12 pgs total:

- Significance (2-3 pgs)
- Innovation (1-2 pgs)
- Approach (6-7 pgs)
- Preliminary Studies/Progress Report
- Investigator & Environment* (1 pg)
- Overall Impact & Future Directions* (0.5 pg)

*Not required sections

NSF Project Decription

15 pgs total:

- Introduction* (2-3 pgs)
- Intellectual Merit (5-6 pgs)
  - Goals and Objectives*
  - Methods*
  - Expected Results/Deliverables*
  - Limitations & Alternatives*
  - Timeline/Resources*
- Broader Impacts (3-4 pgs)
  - Goals and Objectives*
  - Activities*
  - Deliverables*
  - Limitations & Alternatives*
  - Timeline/Resources*
- Results from Prior NSF Support (0.5-1.5 pgs)
  - Intellectual Merit
  - Broader Impacts
- Management Plan
- Evaluation/Assessment Plan
- Summary and Future
- Directions* (0.5 pg)
- 8 pgs for EAGER, 5 pgs for RAPID

**Not required sections*

NSF Broader Impact Activities

- May be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to the project
- NSF values the advancement of scientific knowledge and activities that contribute to the achievement of **societally relevant outcomes**

Broader Impact Activities

- Such outcomes include, but are not limited to:
  - Full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM)
  - Improved STEM education and educator development at any level
  - Increased public scientific literacy and public engagement with science and technology
  - Improved well-being of individuals in society
  - Development of a diverse, globally competitive STEM workforce
  - Increased partnerships between academia, industry, and others
  - Improved national security
  - Increased economic competitiveness of the United States
  - Enhanced infrastructure for research and education

Broader Impacts Resources

National Alliance for Broader Impacts

BI Resources

Helpful Links

NABI Repository on Open Science Framework

NABI OSF Repository Deposit Policy

Results from Prior NSF Support

- Information must be provided for any PI or co-PI that has received NSF funding with a start date in the past five years
- Including any current funding and no-cost extensions
- Describe both Intellectual Merit and Broader Impacts outcomes for each

NIH Revised Protection of Human Subjects

- Preparing the NIH Protection of Human Subject Section and Understanding How It's Reviewed
- Slides from October, 2017 NIH Regional Seminar
  - Research Involving Human Subjects: Revised HHS Regulations & New NIH Policies
  - Research Involving Human Subjects: Basic NIH Requirements and Q&A
- What you needs to know slides: NIH and NLM decks
- A Review of the Common Rule and Its Application
- Mastering the Informed Consent Process
- What Investigators Should Know about IRB Review

NIH Resource Sharing Plan(s)

- PIs/funding recipient institutions are expected to make the results and accomplishments of their activities available to the research community and to the public
- Refer to NIH Sharing Policies and Related Guidance on NIH-Funded Research Resources

NIH Authentication Attachment

Authentication of Key Biological and/or Chemical Resources Attachment

- Meets new Additional Review Criteria for Rigor & Transparency requirements
- Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources used in the proposed studies.
- Key biological and/or chemical resources may or may not be generated with NIH funds and:
  - may differ from laboratory to laboratory or over time;
  - may have qualities and/or qualifications that could influence the research data; and
  - are integral to the proposed research.
- These include, but are not limited to, cell lines, specialty chemicals, antibodies, and other biologics.
- Standard laboratory reagents that are not expected to vary do not need to be included in the plan. Examples are buffers and other common biologicals or chemicals.
- Information in this section must focus only on authentication and/or validation of key resources to be used in the study; all other methods and preliminary data must be included within the page limits of the Research Strategy (Approach).

NSF Data Management Plan

- Even if no data will be collected must still include a statement as such in your plan
- Data management & data sharing
- Separate from Project Description
- 2 pages

NSF Postdoctoral Mentoring Plan

- Any proposal that requests funds to support postdocs
- A separate section, not incld in the Project Description
- Description of mentoring activities that will be provided
- Will be evaluated as part of the merit review process under the Broader Impact criterion
- 1 page

References Cited

- Publications cited in the Research Plan and other parts of your application, not a bibliography
- Demonstrate your breadth of knowledge of your field, relevant to the project
- Use a citation format that that includes all authors names (if you have the space)
- PMCID (*not* PMID) numbers in all applications and progress reports (NIH)
- Page limit usually unlimited (not NSF)

Consortium/Contractual Description

- Programmatic, fiscal, and administrative arrangements between the applicant organization and the subcontracting organization(s)

Letters

Letters of:

- Nomination
- Recommendation/Reference
- Support
- Commitment
- Consortium/Contract Arrangement
- Memorandum of Understanding (MOU)
  - Almost like a contract
    - More detail
    - Assignment of values ($, time, space)

Reference Letter vs. Letters of Support

Reference Letters	Letters of Support
When are they used?	
Used in Fellowships, mentored Career Development Awards, and other programs as requested	Used to demonstrate: -Institutional commitment or resources -Collaboration or role in the project -Potential or current user of a resource or service proposed in the application
Who writes them?	
Referees should be individuals not directly involved in the application, but who are familiar with the applicant's qualifications. The sponsor/co-sponsor(s) cannot be counted toward the 3 required references.	Collaborators, key personnel, institution, and other significant contributors to the scientific development or execution of the project
What should be included?	
-Describe qualities and potential of candidate -Letters can be addressed to "To Whom It May Concern" or "Dear Reviewer"	-Describe the type of support your collaborators will provide to the project -Summarize the agreements you have in place to support your project
Who submits them?	
A referee submits the letters through eRA Commons (no login needed). The letters are maintained separate from the corresponding application.	Applicant organization submits the letters of support as part of the application.
Who sees them?	
Only reviewers and select NIH staff	Anyone with access to view the application

Appendix(ces)

- Prohibited from using the Appendix to circumvent page limitations
- Applicants are encouraged to be as concise as possible
- Only include acceptable materials, refer to the Appendix section of each application instructions for current policy
- Pay particular attention to any FOAs that include appendix requirements that differ from the standard requirements

Use of Hyperlinks in Applications

- The do's and don'ts of hyperlinks in (NIH) grant applications are simple:
- Do include hyperlinks when explicitly requested in application guide, funding opportunity, or NIH Guide notice instructions
- Do use hyperlinks in relevant citations and publications included in biosketches and publication list attachments
- Don't use hyperlinks anywhere else in your application
- It would be hard to read more than a couple paragraphs on the internet these days without encountering a hyperlink to a definition or additional clarifying information. Hyperlinks are everywhere. So, why does NIH limit the use of hyperlinks in grant applications?
- Fairness. Key sections of NIH grant applications –Specific Aims, Research Strategies, and Training Program Plans, to name a few – are page limited. Page limits promote fairness by ensuring all applicants have an equal opportunity to present their proposed project. Linking out to additional supporting information negates our page limits.
- Reviewer Anonymity. We instruct reviewers to rely on the information contained in the grant application and caution them not to follow unrequested links to websites. Website access, especially access to sites controlled by the institution or PI, can be tracked and can compromise reviewer anonymity.
- Security. Just like clicking on links in phishing emails, following links in grant applications can expose a reader to viruses, malware, or other security threats that can compromise our ability to protect application information.
- At the end of the day, risk avoidance may be the most convincing reason to avoid unrequested hyperlinks. NIH may withdraw your application from consideration if you include them. Don't risk it. Write a compelling, self-contained grant application and let it speak for itself.

NEH Application Overview

- Statement of significance and impact
- Table of contents
- List of participants
- Narrative
- Project budget
- Appendices
- Statement of history of grants

NEH Narrative

- Should not assume any specialized knowledge , must be jargon-free
- Project title
  - ≤125 characters
  - Informative to a non-specialist audience
- Provide an intellectual justification for the project and a work plan, a detailed project description
- 25 pg (double spaced) limit
- Formatting
  - 1” margins
  - 11 pt Times New Roman or larger

Questions?

PERSON TITLE

Email
Phone