Useful Sites for Applying to NSF and NIH Grant Opportunities

Appalachian State University, "Exploring Sponsor Funding History"

(**https://orsp.appstate.edu/find-funding/explore-sponsor-funding-history**)

Here is a handy portal for examining past funding by significant federal agencies. There are cross-agency databases (i.e., The Federal RePORTER, USASpending.gov) and agency-specific databases for NSF, NEH, NIH, DoED, IES, EPA, NEA, USDA, IMLS, DOE, DOJ, AHRQ, and NASA.

Eric Whitney, "NSF Career Award Writing Guide: Tips for Writing the Project Description"

(**http://vcresearch.berkeley.edu/sites/default/files/wysiwyg/filemanager/BRDO/CAREER_Writing_Guide_2015.pdf**)

Whitney produces six pages of advice, covering the structure of the project description, advice on writing each section, addressing potential pitfalls, and considering the supplementary documents and biosketch.

University of Maryland, "Proposal Library"

(**http://research.umd.edu/proposal-library**)

Here is a handy site that links to the collections of winning proposals that are being shared by most of the major federal agencies (NSF, NIH, NEH, NEA, DoE, DOD) and the multi-agency Federal RePORTER.

University of Maryland, "NIH Regional Conference"

(**http://research.umd.edu/workshops/nih**)

The slides are available from 40 presentations by NIH staff members at a 2016 NIH regional conference. Subjects include: SBIR-STTR, research integrity, writing an effective application, rigor and reproducibility, training awards, animal and human subjects, R&D contracts, peer review, public access compliance, data sharing, career development awards, biosketches, AREA R15 program, policy update, conflict of interest, understanding FAOs, budgets, post-award, common pitfalls, costs, international collaborations, clinical trials. It is too much to describe briefly – so take a look.

University of Georgia, "NIH Specific Aims Page"

(**http://research.uga.edu/docs/units/ope/Anatomy-NIH%20Specific-Aims-Page.pdf**)

Here is a detailed analysis of what tasks need to be accomplished on a NIH specific aims page – and then a color-coded sample that shows where each task is accomplished.

NIH, "Grant Writing Tip Sheets"

(https://grants.nih.gov/grants/grant_tips.htm)

Here are links to a dozen guides and tip sheets on grants writing that have been put out by units of the NIH.

National Science Foundation (NSF)

(https://nsf.gov/)

NSF funding opportunities (https://www.nsf.gov/funding/) are searchable by keyword, by program areas (e.g., biological sciences, engineering, environmental research and education, mathematics and physical sciences), and by special programs (e.g., broadening participation, graduate students, postdocs). The NSF site also includes the "NSF Research Areas" (https://www.nsf.gov/about/research_areas.jsp). Additionally, there are FAQs, an RSS, a newsletter, and additional policy statements (e.g., the responsible conduct of research, cost sharing, scientific integrity, human subjects). Finally, there is help in constructing a data management plan (https://www.nsf.gov/bfa/dias/policy/dmpfaqs.jsp).

The National Institutes of Health (NIH)

(https://www.nih.gov/)

The NIH Office of Extramural Research offers the "NIH Guide to Grants and Contracts." Through this searchable and extensive database, one can link to both a summary and full text for each FOA (Funding Opportunity Announcement) and sort by NIH institutes and centers, activity codes, funding program title, and various dates (release and expiration). One can search both active and expired funding opportunities for a word or phrase and sign up for a weekly email alert, RSS feed, or twitter notice.

NIH Research Portfolio Online Reporting Tools (RePORT)

(https://report.nih.gov/)

Want to understand what the NIH funds? This site provides a wide variety of tools: RePORTER (a database for searching NIH-funded projects), Awards by Location, NIH Data Book, Funding Facts, Categorical Spending, Report Catalog (tools for searching a repository of reports, data, and analyses), Special Reports, and About RePORT (covers news and offers a brochure and newsletter). The "Links & Data" tab brings one to ExPORTER (a source for downloadable raw data from all RePORTER projects), NIH Clinical Research Studies, the National Center for Biotechnology Information (NCBI) databases and handbook, NSF National Center for Science and Engineering Statistics, World Wide Science (a multiligual global science gateway), ClinicalTrails.gov, and other interesting sites. Another tab is devoted to funding (including "Federal Funds for R&D" and "Federal Funds for Health R&D").

University of Illinois at Urbana-Champaign, "Grant Writing Advice"

(https://proposal.illinois.edu/grant-writing-advice)

This site offers pull-down menus on general advice and specific advice on writing NSF, NIH, and U.S. Department of Defense grants. The general advice menu includes a fair number of classic articles on writing grants.

NIH, "Plain Language: Getting Started or Brushing Up"

(https://www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison/clear-communication/plain-language/plain-language-getting-started-or-brushing)

We all write clunky sentences from time to time. The NIH has addressed issues of clarity in this writing guide, presented as a set of "cards" with ideas to consider and techniques to master. The five sections cover: Before You Start Writing, Connecting with Your Readers, Presenting Your Information, Formatting and Visual Clarity, Testing and Revising. As we all have these problems, do not be embarrassed.

3. Helpful Websites: Proposal Development (Annotated)

a. NSF

The NSF provides a number of helpful guides for proposal development and understanding the meaning of NSF's requirement that projects have a "broader impact": "A Guide for Proposal Writing" (https://www.nsf.gov/pubs/2004/nsf04016/start.htm), "Proposal and Award Policies and Procedures Guide" (https://www.nsf.gov/pubs/policydocs/pappg17_1/nsf17_1.pdf), "Application Guide: A Guide for Preparation & Submission of NSF Applications via Grants.gov" (https://www.nsf.gov/pubs/policydocs/grantsgovguide0117.pdf), "Prospective New Awardee Guide" (https://www.nsf.gov/bfa/dias/caar/pnag/pnag_jan2017.pdf), a "Dear Colleague" Letter on the Meaning of Broader Impact" (https://www.nsf.gov/pubs/2007/nsf07046/nsf07046.jsp), and an NSF publication entitled "Perspectives on Broader Impacts" (https://www.nsf.gov/od/oia/publications/Broader_Impacts.pdf).

b. Other Sites that Offer Advice and Examples Regarding NSF Proposal Development

1. **Sample NSF Biosketchs**

(http://www.cas.usf.edu/research/data/propdev/4bio/1-NSF-Biosketch-Sample1.pdf)

(http://www.baruch.cuny.edu/grants/documents/Scherbaum.BiosketchTemplate.pdf)

(http://rgw.arizona.edu/sites/researchgateway/files/times_11_point_nsf_biok_instructions.pdf)

Here is a section-by-section discussion on how to construct an NSF biosketch. It may help.

2. **Samples of Full NSF Proposals**

(http://www.cas.usf.edu/research/data/propdev/8funded/1-NSF-Complete-Proposal-Sample1.pdf)

(http://www.cas.usf.edu/research/data/propdev/8funded/2-NSF-Complete-Proposal-Sample2.pdf)

(http://www.cas.usf.edu/research/data/propdev/8funded/Career-Proposal-Sample.pdf)

(http://www.utoledo.edu/research/samples.html)

3. NSF, "The 2010 User-Friendly Handbook for Project Evaluation"

(https://www.purdue.edu/research/docs/pdf/2010NSFuser-friendlyhandbookforprojectevaluation.pdf)

Authored by Joy Frechtling *et al*., this guide covers types of evaluation (formative, summative), steps in doing an evaluation, techniques in gathering data (e.g., surveys, interviews, focus groups, observations, tests). The emphasis is on human subjects rather than natural phenomena. In this case, user-friendly means no math or statistics.

4. Jean Feldman. "How to Prepare an NSF Proposal: The Good, the Bad and the Ugly"

(https://www.nsf.gov/bfa/dias/policy/outreach/propprep_aug2016.pdf)

Here is a PowerPoint by the Head of the NSF Policy Office that does a good job (never bad or ugly) of going through the process.

5. Georgia Tech: Sample Broader Impact Statements

(http://www.osp.gatech.edu/sample-broader-impact-statements)

6. National Alliance for Broader Impacts (NABI), "Broader Impacts Guiding Principles and Questions for National Science Foundation Proposals"

(https://www.wpi.edu/sites/default/files/inline-image/Offices/Sponsored-Programs/nabi_guiding_principles.pdf)

The NABI has developed a one-pager addressing the key information regarding broader impacts.

7. Centers for Ocean Sciences Education Excellence (COSEE), "Ocean Scientist Broader Impact Wizard"

(http://coseenow.net/wizard/)

After opening a free account, one can view a video and create a broader impact statement through a 5-step process that considers audience, budget, activity, project description, and evaluation.

8. John Tsapogas and Marina Vasilyeva, "Advice on NSF Research Proposal Development"

(https://www.rfcuny.org/FilesDirectory/Other%20Documents/documents/NSF_Proposal.pdf)

This PowerPoint presentation looks at all the pieces and puts it all together neatly – a good place to begin as full of good information.

9. Linda Madsen, "A Guide to NSF Success"

(http://www.sciencemag.org/careers/2007/07/guide-nsf-success)

This July 2007 article in *Science* covers planning, addressing intellectual merit and broader impacts, common mistakes, dealing with a proposal that is declined, and renewals of prior support.

10. George A. Hazelrigg, "Twelve Steps to a Winning Research Proposal"

(http://www.unco.edu/research/pdf/grant-writing-websites-docs/agency-specific-proposal-writing/NSF12steps.pdf)

An NSF Program Director with 18 years of experience gives advice.

11. Pam L. Member, "NSF Grant Reviewer Tells All"

(http://www.sciencemag.org/careers/2003/04/nsf-grant-reviewer-tells-all)

This reviewer may not tell all; but, she does distill some lessons for NSF applicants.

c. NIH

(https://www.nih.gov/)

All NIH policies are collected and available in the "NIH Grants Policy Statement." The "About Grants" tab (https://grants.nih.gov/grants/about_grants.htm) includes: a grants process overview, getting started, an explanation of how the application is referred when received at NIH and peer reviewed, the pre-award process, and a forms library. The "How to Apply" section (https://grants.nih.gov/grants/how-to-apply-application-guide.html#format) introduces an Application Guide with major discussions of preparing to apply and writing the application. The discussion of "Write Your Application" (https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm) covers a multitude of topics that include: what peer reviewers look for, the review criteria (i.e., significance, strength of researchers, innovation, approach, environment/support), qualifying as a new or early investigator, the research plan, and important writing tips. There is also a link to grant writing tips developed by the various NIH Institutes and a link to more than 20 sample completed applications. The National Institute of Allergy and Infectious Diseases has a particularly good "Apply for a Grant" guide (https://www.niaid.nih.gov/grants-contracts/apply-grant). Finally, there are also You Tube videos covering many topics (e.g., "NIH Peer Review Revealed," "Jumpstart Your Research Career with CSR [NIH's Center for Scientific Review] Early Career Reviewer Program," "What Happens to Your NIH Grant Application," and "NIH Tips for

Applicants"), blank fillable data tables, and formatting pages for biosketches (**https://grants.nih.gov/grants/forms/biosketch.htm**) **and a link to SciENcv (a site that can reportedly assist in creating and correctly formatting the required biosketch).**

d. Other Sites that Offer Advice and Examples Regarding NIH Proposal Development

1. **NIH Full Sample Proposals**

(**https://www.niaid.nih.gov/grants-contracts/sample-applications**)

(**http://www.utoledo.edu/research/samples.html**)

2. National Institute of Mental Health, "Common Mistakes in NIH Applications"

(**https://www.nimh.nih.gov/funding/grant-writing-and-application-process/common-mistakes-in-writing-applications.shtml**)

3. A Sample NIH Biosketch

(**http://www.cas.usf.edu/research/data/propdev/4bio/2-NIH-Biosketch-Sample1.pdf**)

4. **Avrom Caplan, "Understanding Funding Opportunities at the NIH"**

(**http://docplayer.net/23952895-Understanding-funding-opportunities-at-the-nih.html**)

A CUNY Associate University Dean for Research uses a PowerPoint to explain the NIH application process, to examine some specific award programs (e.g., R15, R03, R21, R01), to provide advice on constructing an effective biosketch and resource page, and to discuss the review criteria.

5. **Rick McGee, "Keys to Writing Successful NIH Research, Fellowship, and Career Development Grant Applications"**

(**http://docplayer.net/14837059-Keys-to-writing-successful-nih-research-fellowship-and-career-development-grant-applications.html**)

A Dean at Northwestern's Feinberg School of Medicine introduces the NIH grant review process and the components of NIH proposals, explains the review criteria and scoring, and emphasizes what sections are critical to success. A PowerPoint presentation.

6. Sarah Bottjer, "Grant Writing Tips & Submitting an NRSA to NIH"

(**https://dornsife.usc.edu/assets/sites/734/docs/Writing_an_NRSA_Sarah_Bottjer.pdf**)

This PowerPoint offers a timeline for preparing an application for the National Research Service Award (NRSA), explains the review process, analyzes the components of the research plan, and gives quite a lot of detailed advice on writing about specific aims, background and significance, preliminary results, and the research design and methods.

7. NIH Center for Scientific Review, "Insider's Guide to Peer Review for Applicants"

(https://public.csr.nih.gov/ApplicantResources/InitialReviewResultsAppeals/Documents/InsiderGuideApplicantsFINAL.pdf)

This guides uses a fairly breezy approach, but still makes salient points (e.g., avoid proposing to collect more data, be brief with stuff everybody knows, don't overstate the significance of your research).

8. *Science* Career Editors, "The NIH R01 Toolkit"

(http://www.sciencemag.org/careers/2007/07/nih-r01-toolkit)

The staff at *Science* provides help for those biomedical scholars seeking to break into NIH funding through the R01. They analyze the different types of R-series grants, how to qualify, the work of the Center for Scientific Review and how proposals get routed to study sections, the process of excluding competitors from being your reviewers, and the criteria that reviewers use (i.e., significance, approach, degree of innovation, qualifications/potential of the investigator, strength of institutional support). Note that this article is a 2007 revision of a 2001 original. Many of the links to NIH pages no longer work, so you may need to find newer versions of related NIH information. Yet, the basic framework and advice have not really changed.

9. Sarah A, Webb, "Submitting Your Best-Possible R01 Application"

(http://www.sciencemag.org/careers/2012/05/submitting-your-best-possible-r01-application)

Though less detailed, researchers seeking R01 funding might also want to consult a more recent *Science* article.

10. NIH, "8 Ways to Successfully Navigate NIH Peer Review and Get an R01"

(https://videocast.nih.gov/summary.asp?live=20189&bhcp=1)

NIH has prepared this video on the entry-level R01 grant program. The eight tips are fairly generic (e.g., avoid common errors, know what reviewers are looking for and who reviewers are).