

How to Plan a Grant Application



From the National Institute of Allergy
and Infectious Diseases'
[All About Grants](#) Series

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Develop a Strategy for Planning an NIH Grant

If you're embarking on a quest for an NIH grant, you'll need a strategy. Ours is specific to NIAID because we fund research project grant (R01) applications in strict percentile order, reflecting the quality of the science. Some other institutes have different approaches. For NIAID, the key to success is writing an outstanding application that appeals to its audience of NIH peer reviewers, your application's judge and jury.



To begin planning your grant, start with these ten steps:

1. Assess your field. Find out the opportunities for collaborating with a known laboratory or more experienced grantee.
2. Check out the competition; see which other projects in your field are being funded. Search the NIH [CRISP database](#).
3. Evaluate yourself: How do your strengths match up with the topics you uncovered in step 1? Can you capitalize on your expertise and fill in any gaps with mentors, collaborators, or consultants?
4. Figure out what resources and support your organization has and what other support you'll need.
5. Brainstorm ideas with colleagues and mentors.
6. Call an NIAID program officer for an opinion of your idea.
7. Write the hypothesis for your proposal in 25 words or less.
8. See if your idea matches any NIAID initiatives reflecting our high-priority areas.
9. Give yourself plenty of time to write the application, probably three to six months.
10. Start thinking about your next application! As long as the topics are different you can apply for as many as you like.

How to Choose an Application Topic



At the outset you'll need to decide whether to apply for an NIAID initiative or generate the topic yourself. Think of an application as a building. If you hire a talented architect and give him or her full reign of expression, you could end up with a beautiful structure. But the more constraints you add, the more you limit the architect's ideas.

The same concept applies to applicants. When you independently send NIH your best ideas -- we call these applications investigator-initiated -- you

can best capitalize on your strengths. If you go this route, you propose an exciting and important project in your area of interest and make the case for it in your application. To find a great idea, brainstorm potential topics with some colleagues -- concentrate on ideas in your area of expertise that would make an impact on public health. Do your homework -- spend at least a few days checking out the literature in your proposed topic's field to make sure your topic fills gap in existing research. See our suggestions on [how to do a literature search](#) for help. Most applications NIAID funds are topics investigator-initiated.

Alternatively, you could respond to an institute initiative. One limitation of this approach is that you're bound by the specifications of the announcement. While these may suit you perfectly, often they do not. On the other hand, you don't have to worry about convincing reviewers of the importance of your project. For initiatives, we've already determined the topic's high priority.

Should You Respond to an Institute Solicitation?



Since you can't apply twice for the same grant, you have to choose between applying for an investigator-initiated award or an institute initiative. If you respond to an institute solicitation, you'll create an application in a critical area for NIAID. Initiatives come in three flavors: requests for applications (RFA), requests for proposals (RFP), or program announcements (PA). Whereas RFAs seek grant applications in a well-defined scientific area, PAs are more open ended, requesting applications or reminding the community of NIAID's interest in a scientific topic. Another big difference is that RFAs set aside money to pay for grants, whereas PAs often do not, though some PAs fund applications beyond the payline. RFPs solicit proposals for contracts, which are not covered on this Web site. See the table on the next page for a more detailed comparison of investigator-initiated applications, RFAs, and PAs.

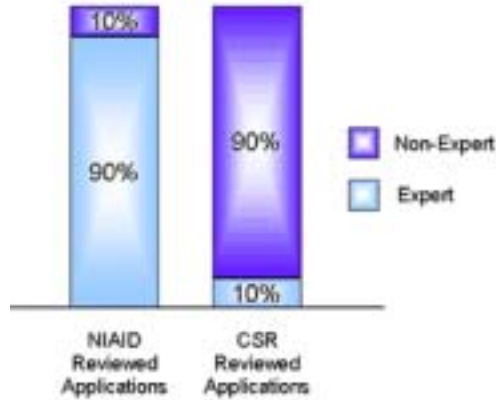
To find out if NIAID has any initiatives that are right up your alley, go to NIAID's list of [RFAs](#) and [PAs](#) and call an NIAID program officer. We also put our concepts on the Web to give you a preview of what may be coming. Concepts are ideas for initiatives that are approved by Council, some of which will be published depending on funds available. Our concepts and initiatives on the Web include a contact person who can give you more information. To find out about initiatives in another institute, you could ask a program officer if he or she knows of any in your area, and visit the [NIH Guide](#).

Comparing Investigator-Initiated Awards, RFAs, and PAs

	Receipt Date	Money Set Aside	Review Committee	Funding Advantage to Applicant
Investigator-initiated	Continuous	None; we fund in percentile or priority score order.	In CSR.	You can tailor the application to your expertise.
RFA	Single	Always specifies funds and target number of awards.	Reviewed in institutes. Same review committee for all applications.	Competition depends on number of applicants.
PA	Continuous	No set asides but high-priority applications may have easier time getting funded.	In CSR by many review committees.	Competition more tied to the payline.

As you can see, there are a number of differences in the way investigator-initiated applications, RFAs, and PAs are treated. Most of these differences are very difficult to factor in and thus shouldn't be a major factor in your decision. For example, applications responding to RFAs are reviewed together as a group. In contrast, PAs are not reviewed together; rather, the application goes to whatever study section is the best match. For PAs, CSR reviewers may not be excited about an area even though it's a priority for NIAID.

When RFAs are reviewed at NIAID, the vast majority of reviewers will have expertise in the field. This can be a positive or a negative -- you have the advantage of an audience that is fluent in the particulars of your field, but their experience will likely make them more critical of any perceived problems in your application.



Initiatives Can Be Advantageous, But Aren't Necessarily



Why apply for an initiative? Sometimes it's easier to get funded, though RFAs can also be highly competitive. To assess your chances before you commit time to writing an application, talk to the program officer to gauge the competition you're likely to face and to find out about Institute priorities. Also, read the initiative to see how much money NIAID is putting aside for the awards.

If your application does not get an award as part of the initiative, you can revise it and resubmit as an investigator-initiated R01. Reviewers may view it favorably since it's in a high priority area.

In any case, it's best to stay in your area of expertise. Capitalizing on your strong points is a better strategy than trying to please NIH by responding to an initiative that's not up your alley. This is particularly true for NIAID because getting a favorable review outcome, a low percentile, is our key funding determinant.

RFAs and PAs May Have Special Requirements

If you've decided to respond to an RFA or a PA, read the *Guide* announcement carefully to see what area of research it defines and special requirements for applicants, including review criteria. The announcement also has the name of the program contact person whom you can call for more information.



RFAs and PAs list a lot of information, not all of which is necessary to write a successful application. To see what parts of the RFA give you what information, check our ["Reading a Typical RFA" graphic](#). Also, be sure to fill out the RFA label in the 398 forms.

After you submit the application to CSR, NIAID program staff reviews it to make sure it responds to the RFA's or PA's objectives and requirements. This administrative review is not related to peer review; it does not assess the science. However, if our program staff feels the application is non-responsive, NIH will return it to you without a peer review.

Develop a Solid Hypothesis

Most top-notch NIH grant applications are driven by strong hypotheses rather than advances in technology. Think of your hypothesis as the foundation of your application -- the conceptual underpinning on which the entire structure rests. Generally applications should ask questions that prove or disprove a hypothesis rather than use a method to search for a problem or simply collect information.



However, a new trend is pushing us toward more applied research. Especially in key areas, such as studies of organisms used for bioterrorism, we will be turning more to applications seeking to discover basic biology or develop or use a new technology. If your application is not hypothesis-based, state this in your cover letter and give the reasons why the work is important.

Choose an important, testable, focused hypothesis that increases understanding of biologic processes, diseases, treatments, or preventions. It should be based on previous research. State your hypothesis in both the specific aims section of the research plan and the abstract.

An example of a good research hypothesis:

- Analogs to chemokine receptors can inhibit HIV infection.

Examples of a poor research hypothesis:

- Analogs to chemokine receptors can be biologically useful.
- A wide range of molecules can inhibit HIV infection.

Make sure your idea is not too broad. Your hypothesis must be provable during your three- to four-year award with the level of resources you are requesting.

Keep in mind that your topic should fit with the NIH mission. Basic scientists should remember that NIH is the National Institutes of *Health*. NIH's mission is to improve health through science--just moving science forward is not enough. NIH funds come from the taxpayer through Congress, to whom we are accountable. So tie your science to curing, treating, or preventing disease. When they review your

application, reviewers will judge the likelihood that your research can make an impact on public health.

Reviewers also want to see how your project fits into the big picture in your field. Make this clear and explicit. Search [CRISP](#) to see what other projects in your field NIH funds, so you can carve out your niche.

Don't confuse your hypothesis with your methods. Methods are the means for performing your experiments. Your experimental results will prove or disprove your hypothesis.

If you have more than one hypothesis, choose the better one.

Plan Your Application

After you've chosen your hypothesis, outline your specific aims. List your aims; then list all the experiments you'll do to support each aim. Use graphics to plan your experiments. Chart out the experiments with decision trees showing alternative pathways should you get negative results. Include these graphics in your application; they'll help reviewers understand what you plan to do. Keep in mind that your experiments support your aims, and your aims support your hypothesis.



The scale of your hypothesis should fit your request of time and resources, so make sure it will generate aims and methods you can accomplish within that time and with those resources. Reviewers will quickly pick up on how well matched these elements are, so you should write a hypothesis that's provable with the resources you would have if you got the grant.

Decide Award Type and Duration

You'll need to decide how many years of funding to request -- item 6 on the face page. If you're a new applicant, you should probably ask for no more than four years of funding, though be prepared to get only three. More experienced applicants can request five years, but should stick to four if researching a new topic.



Most applicants go for an R01, the basic research project grant. Other NIH programs support special areas, like research centers or conference grants, or are targeted to certain types of investigators, such as physicians or trainees.

Determine What Documentation You'll Need



Before putting pen to paper or fingers to keyboard, think about the documentation you'll need to complete. Are you using stem cells? Are you studying animals or identifiable human products? Will your application be modular?

If your research includes human subjects or vertebrate animals, you'll include special documentation, including plans of reports you'll be making, informed consent forms, and other items. If you're requesting less than \$250,000, which you should as a new investigator, you'll follow instructions for a modular application. If you're applying as a foreign institution, you'll use a special budget justification form. If you're studying stem cell cells, you'll need to complete many requirements outlined on the NIH Stem Cell Information site. These items are a sample of potential requirements; read the PHS 398 for more information, and see Section III g. Assurances for which assurances your institution must file before we can award a grant.

Develop a Modular Budget



If you're a new investigator, you'll most likely be preparing a modular budget. All NIH applications requesting less than \$250,000 are modular, i.e., three-, four-, or five-year budget in \$25,000 modules with no increments for inflation for future years. Because modular budgets have no annual budget increases, you'll have to plan the entire budget--everything you'll need--at the outset. If you've never done this before, get help. Reviewers will judge your competence partly by how well your funding request matches the scope of the project.

Send NIH Some Materials "Just in Time"

Some items required in the 398 are not sent in with the application. Rather, you send them just in time (JIT), when NIAID is ready to issue your award. JIT is used for other support information and several items for human subjects research: certification of IRB approval, OHRP assurance, and the letter that all key personnel have been trained in protecting human subjects. If your IRB approval is ready, include it in the application.



NIH will send back your application without a review if it includes other support information! Don't send it in before they request it.

While the JIT approach may seem to save you time, beware: you still need to prepare the information early enough so it's ready when we ask you for it.

Some ICs, including NIAID, are specifying the JIT format for applications submitted in response to RFAs. Read the RFA announcement for details.

Advice for New Investigators

Who Is a New Investigator?



NIH considers you a new investigator if you've never been a PI on a PHS-supported research project other than a small grant (R03), Academic Research Enhancement Award (R15), exploratory/developmental grant (R21), or K series career awards except K02 and K04.

Make sure you get counted as new. Check the checkbox in the application face page so NIH and reviewers can readily identify you. Also state in the biosketch that you are a new investigator. It's to your advantage to identify yourself as a new investigator because reviewers expect fewer prior achievements from you.

Form Approved Through 05/2004 OMB No. - 0925-0001

Department of Health and Human Services Public Health Services Grant Application		LEAVE BLANK—FOR PHS USE ONLY	
Do not exceed 50-character length restrictions, including spaces.		Type	Number
		Activity	Formerly
		Review Group	Formerly
		Council/Board (Month, Year)	Date Received
1. TITLE OF PROJECT			
2. RESPONSE TO SPECIFIC REQUEST FOR APPLICATIONS OR PROGRAM ANNOUNCEMENT OR SOLICITATION <input type="checkbox"/> NO <input type="checkbox"/> YES (If "Yes," state number and title)			
Number: _____ Title: _____		New Investigator <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	
3. PRINCIPAL INVESTIGATOR/PROGRAM DIRECTOR			
3a. NAME (Last, first, middle)		3b. ORGANIZATION	
3c. POSITION TITLE		3d. MAILING ADDRESS (Street, city, state, zip code)	
3e. DEPARTMENT, SERVICE, LABORATORY, OR EQUIVALENT			
3f. MAJOR SUBDIVISION			
3g. TELEPHONE AND FAX (Area code, number and extension)		E-MAIL ADDRESS:	
TEL: _____	FAX: _____		

Reviewers Have Different Expectations for New Applicants

In evaluating applications, reviewers expect new investigators to have less preliminary data and fewer resources than would more established people. They are looking more at potential than achievement. While you're expected to have fewer publications, balance that by including more biographical information.



Generally for new applicants, less is more. Reviewers will be more inclined to give you a fundable score if you ask for less money and fewer years and bite off less work to do -- that means fewer specific aims in your research plan and leaving out any nonessential information reviewers can find fault with.

Tips for New Applicants



Though novel ideas often come from new investigators, they have to work harder to sell themselves. If you're a new investigator, make sure your potential shines through the application by showing you have your own resources and institutional support, are independent, and are able to lead. Reveal your independence as an investigator through your publications -- first and last authors are more impressive than those in the middle.

Impress reviewers by showing a solid understanding of the literature and a recognition of the strengths and weaknesses of your methods.

You can also wow them by bringing in collaborators to fill gaps in your expertise and resources, especially a mentor or collaborator who is well known. If you don't have a well-known mentor or a string of publications, you can compensate by finding a well-established investigator to be a collaborator. Then try to get your application assigned to a study section where some of the members know your collaborator's work and research potential. When a proposal is assigned to a study section whose members have barely heard of the investigator, it may have a weaker chance of faring well.

See our other tutorials on the main [All About Grants](#) page.