

Tips for Writing a NRSA F31 Style Fellowship in the Natural Sciences

You are ready to begin your NIH F31 fellowship! With the help of our F31 Quick Start Guide, you now know what to include in your application. Here are some helpful tips that can assist you during the writing process!

I. Knowing Your Audience

1. *Determining the institute where you will be submitting your fellowship*

- The NIH is composed of *27 distinct institutes* with specific biomedical research agendas.
 - o Make sure to check institute webpages, along with contacting grant officers from these institutes (via email or phone) to ensure that your research aligns well with the institute's mission and focus.

2. *Basic science vs. translational science*

- NIH sponsored grants focus more so on basic science rather than translational science, while others, such as the AHA, are looking for more of a translational approach. Most likely, your project has elements of each, so spin your narrative and project accordingly!

II. Titles – sometimes more difficult to come up with than you think!

- Titles should be as concise as possible, but you must be sure to include enough detail to cover the main points and implications of the study.

1. *How to be less wordy*

- Do not include unnecessary adjectives or redundant words. You may think they are helping to sell your project, but they are not!

2. *Making titles with impact*

- If possible, it is a good idea to include keywords or “hot” words from your field. Do not oversell your project by claiming it is something it is not, but be sure to make it sound intriguing and relevant in its title.

III. How to formulate specific aims

1. *Relation of aims to each other*

- Specific aims should follow a general theme and work towards the common goal of the proposal, but should also be independent from each other.
 - Aims can be mechanistic or characterization based.
- A nice mix of mechanistic and characterization is fine, however, your entire proposal should not be composed of simply characterization aims.

2. *Different ways to state aims*

- Aims can be phrased and stated in different ways.
- Some common ways to phrase an aim:
 - “To test the hypothesis that...”
 - “Determine/elucidate the mechanism...”
 - “Examine how...”
 - “Design a...”

3. *Inclusion of subaims*

- Some students prefer to break their specific aims down into subaims.
- Subaims allow for further definition of different parts of a specific aim.
- Subaims are a nice organizational tactic, allowing reviewers to refocus each time they get to a new subaim.
- Normally, each specific aim has 2-3 subaims.

4. *How much is too much...?!?!*

- One of the most common reviewer comments is that a proposal is too ambitious.
 - Remember, you are only one grad student asking for 2-3 years of funding.
 - What you propose should be feasible to complete in those 2-3 years.
- 2 vs. 3 aims?
 - Most proposals have 2 aims. However, if each of your aims is “smaller” and does not contain many experiments, it might be wise to include a third aim.

5. *What to include in the specific aims page brief abstract*

- Many students include a paragraph-long, very brief introductory abstract at the top of their specific aims page. This is a nice addition because it centers reviewers to the science surrounding your proposal and highlights a gap in knowledge that needs to be addressed.

IV. Significance and Background

1. *What is necessary to include?*

- Try to keep this section to approximately one page. You will have opportunities later on in the document to add more specific background facts where necessary.
- Start broadly, and then with each successive paragraph, make the background more specific until it ties directly in to each aim.
- If there is background that is highly technical but would still serve as a valuable addition to your strategy, add it to a specific subaim, not the background section.

2. *What type of spin/how much the project should be sold in this section?*

- The final paragraph should highlight the contributions the proposal would make to your general field. Additionally, you should highlight how each aim would contribute to answering a specific problem, and how those answers would move your field forward.

V. Preliminary data section

1. *Why preliminary data is helpful!*

- Showing preliminary data indicates that you have already committed a reasonable amount of work to the project and that the direction you are headed in has the potential to be successful.

2. *Differences in setup*

- Some students have *a separate section* for preliminary data, while others *work it into* their specific aims approach section.
- Either or is fine!

3. *Figure design*

- *Figure legend*- must contain a short, descriptive title of figure, along with a few short sentences of description that indicate what is shown in the figure and significance.
- *Figure content*- neat appearance (matching colors or patterns, fonts, etc.), error bars, statistical indicators, etc.

VI. Approach/Experimental Design

- For each specific aim, consider having:
 1. *Brief background paragraph*
 - This background will be specific to the aim and will include details that are more tailored to the aim, rather than the overall proposal
 2. *A few background sentences pertaining to the specific subaim (optional)*
 - Some students include one or two sentences of background that are very specific to the subaim. Good for including random details that would not fit in well elsewhere.
 3. *Small approach paragraph*
 - Experimental setup/details to show you have thought about how to carry out experiments.
 4. *Expected results/alternative approaches*
 - **This part is important** – demonstrates critical thought.
 - Really describe what you think will happen and why.
 - Come up with feasible alternatives to experiments and describe why they would be good alternatives.
- Sometimes one or the other is not necessary.
- *repeat setup for each aim/subaim

VII. How to Critique Your Own Work!

1. *It is difficult to be your own critic!*

- Many students look back at their work and wonder, “How did I miss this?” or “How come I did not explain this very well?” It is difficult to catch mistakes in something that is your own work and something you have already looked at an excessive number of times. Take some time off from working on the document and then come back to it with fresh eyes!

2. *Tips and tricks to help you read through your own work*

- Search for very technical or “science-y” words. Have you defined them or explained them well enough that a non-expert will understand?
- When proofreading, only do a page or two at a time. Doing this in small amounts will help you from becoming bored and losing focus.
- Work with a senior student in your lab or your PI on how to better pick out issues with your fellowship. Actively learning what they look for and how to fix it will help you apply their techniques on your own.

VIII. How to Incorporate Revisions

1. *Most students do not receive a fellowship on the first submission!*

- Depending on the institute, success rates range from ~8-26%. Don't give up!

2. *How to address reviewers' comments*

- Reviewer comments are always a grab bag of “fun.” You believe that if you address *everything*, you will be a shoo-in for an award when you resubmit. Unfortunately, some reviewer requests may be unreasonable or unfeasible. Thoroughly discuss with your PI which comments you should address through additional experiments or better explanations, and which to “ignore” or explain away in your resubmission letter.

3. *How to incorporate revisions*

- In the research strategy
 - Depending on the institute, you will be asked to either *, [], or change the color of the newly added portions of text or figures.
- In the resubmission letter
 - After thanking your reviewers for their attention and comments, provide a point-by-point response to each reviewer's comments. Specifically, for each comment, restate the comment in bolded font and then explain your response after the comment. You can highlight data you have added, how you may have altered some ideas or proposed experiments, or how you respectfully disagree with what they have to say and why.

IX. Repurposing Your Fellowship

- The American Heart Association (AHA) sponsors a predoctoral fellowship with similar guidelines. You can reuse the majority of your supporting documents and only have to make slight alterations to your research statement. Additionally, you must complete an Individual Development Plan (IDP).
- The website <http://www.fic.nih.gov/FUNDING/NONNIH/Pages/predoctoral-graduate.aspx> lists a plethora of funding opportunities that you can use parts of your F31 for submission.

X. Resources

1. *The Yale Graduate Writing Lab (YGWL)*

- One-on-one consultations
 - Graduate writing advisors will work one-on-one with you to edit and polish your fellowships so they are ready for submission!
- Peer review groups
 - These small groups (up to 8 students per group), facilitated by a graduate writing advisor, begin approximately two months prior to the cycle submission date. Students provide and receive feedback on various fellowship sections. It is always nice to have input from others not directly in your field of research!
- Workshops
 - At the beginning of each submission cycle, a graduate writing advisor will host an informative workshop that covers the basics of F31 submission and will answer all and any questions you have!

2. *Fellowship websites*

- NIH websites
 - <https://researchtraining.nih.gov/programs/fellowships>
 - <http://www.cancer.gov/grants-training/training/funding/f31>
- NIH/NIGMS sample applications
 - <https://www.nigms.nih.gov/training/indivpredoc/pages/predoc-f31-sample-applications.aspx>

3. *Your PIs, committee members, peers!*

- Do not be shy about asking your PI for time to discuss ideas/different parts of your fellowship!
- Committee members may be able to provide you with different perspectives on your fellowship that may strengthen your overall research strategies. Set up meetings with them to discuss the aspects of your research with which they are most familiar.
- Older graduate students are often very willing to provide feedback on your fellowship or offer scientific writing tips. Do not be afraid to ask them for help!