

## **GRFP writing workshop. 4 October 2018.**

Lars Brudvig, Associate Professor, Department of Plant Biology

**Some background on me:** I applied to the GRFP (unsuccessfully), have been the primary mentor or written letters for 5 or 6 GRFP recipients, including undergrads and grads in my lab here at MSU, and have served on the GRFP application review panel for NSF.

**Overall goal:** convince reviewers of your outstanding potential as a scientist. When I served on the panel, the explicit charge was for us as reviewers was "identifying individuals early in their careers with the demonstrated potential to be high achieving scientists". So, how do you do this?

Here's some advice:

- 1) First, **read the GRFP website** and, in particular, the pages on "Application components" ([https://www.nsfgrfp.org/applicants/application\\_components](https://www.nsfgrfp.org/applicants/application_components)). Lots of helpful points here, including a set of questions to help guide your personal statement, proposal, and selection of letter writers.
- 2) **Read successful GRFP applications.** Hopefully you've already been able to do that here? From this, you may realize commonalities among successful applications, such as clarity of the writing, dedication to doing science (intellectual merit) and extending beyond the science itself (broader impacts), and strong sets of prior experiences. But, also that there isn't a single formula for being successful. You need to consider the overarching goal - again to convince reviewers of your outstanding potential as a scientist - and then consider how to best do this given your background, strengths, and vision.
- 3) With this, consider what your **core talking points** are and ensure that these come across really clearly. Again, why should a reviewer consider you to have great potential as a high achieving scientist? This will be somewhat different for every one of you, but successful applicants will typically have one or more strong previous experiences to draw on (nothing predicts future success as well as past success), spanning intellectual merit and broader impacts, clear articulation of vision for yourself as a scientist, and a well written proposal with, again, strong intellectual merit and broader impacts.
- 4) I know I just said this, but I'll repeat it: **Maximize clarity.** Your application will be reviewed by three panels and each panelist will be tasked with ~30 applications. It's a really hard task to sort these out, since there are so many really strong applicants. If your application is unclear, confusing, poorly written, or doesn't do a good job at selling your talking points, it's probably not going to make the top of the list REGARDLESS of how amazing your credentials are. So, revise, revise, revise until it shines!
- 5) **Be personal** - particularly in the personal statement. Remember, the GRFP is supporting individuals, not projects - you want to demonstrate that you are and will continue to be a successful scientist. You do this in the research statement through a compelling and well-written proposal (more on this later). And, the personal statement is an opportunity to breathe life into your application. Converting your CV into paragraph form is a missed opportunity, in my mind (and really boring to read). What drives you? Why are you so passionate about what you're getting into that you want to dedicate your career to it?

How have you worked to build a strong set of past experiences and how have these past experiences shaped you and your vision for yourself in the future? These are some questions to consider.

6) Take both **intellectual merit and broader impacts** seriously, since your application will be rated based on both. Panelists will need to comment on both in your review, as they rank you on a 0-50 point scale (which is then standardized across all panelists, to account for the fact that panelists will use this scale differently [some will give everyone between a 40 and 50 and others will use the entire 50 point scale] and, with only 3 panelists per application, this helps avoid stochasticity). So, be sure to work with IM and BI in your personal statement and proposal.

7) Remember, **you don't need to actually do the research in your proposal** (though in most cases of first or second year grad students, you probably will do something at least similar). The proposal is a writing exercise to show how well you can motivate and articulate a line of research. Remember - they're funding individuals, not projects, and they want to see that you have good ideas and that you've matured as a scientist to the point where you can write a proposal like this.

8) Get others to read and provide **feedback** on both of your statements. This working group is perfect, but consider also branching out to other grad students, faculty, and even folks outside of science (e.g., family members), as these individuals may have valuable feedback on how well you're telling your story.

Some questions that Laura and Clarice asked that I address:

#### **What components are most important in the personal vs. research statements?**

IM and BI's. Both in both. Personal focuses on past, your motivations, your vision. Research focuses on a particular line of research and associated BI's.

#### **What makes an applicant stand out?**

Three c's: concrete, credible, and creative. How do you demonstrate these things? One or more really strong past experiences, particularly if they can demonstrate engagement and leadership in both IM (doing science) and BI's (impacts of the science beyond the science itself). Super clearly written personal statements. Well written, engaging, and interesting research, with high likelihood of succeeding and being impactful science. Creative and impactful BI's.

#### **How much detail to include in the proposal for Intro, Methods, Hypotheses, Intellectual Merit, and Broader Impacts?**

Both IM and BI's are important and panelists need to consider and explicitly comment on both in their reviews, but they don't have to (and probably won't be) weighed 50:50. Most successful applications give ~1.5 pages or a tiny bit more to IM and 0.5 pages or a tiny bit less to BI's.

For **IM**, frame big (panelists will be mostly reading outside their area of expertise, so help them understand how you're working on a **big, important problem**), identify a key **knowledge gap** within this area, set up and propose **q's or hypotheses** (could be aims, but these typically don't go over so well in

our field), lay out **methods** that VERY clearly map to and address the q's or H's. Some will then articulate **expected outcomes**, which can work well by showing how your data would look if supporting your H (and can help close the loop from data, back to Q's). Some will also have an **explicit statement of IM** (can be helpful if well done, linking your specific work back to the big picture). How much to each part? Tricky and there's probably no recipe. But, I prefer more emphasis on the Intro - making a very clear, logical argument for the research as big, important, and necessary, getting to the Q's by the end of the first page (maybe 3/4 through the first page). If I'm not on board with the big picture and importance of the line of research, the methods don't mean much (so, a proposal that jumps quickly to and spends most of the proposal laying out what will be done may not rank as high with me). But, that said, the methods need to be clearly articulated and, again, clearly parallel to the Q's. The challenge, of course, is to do all this in so little space! **One pitfall is to propose too much research**, with too many threads. One approach that I like is to propose one (maybe two) questions, along with two lines of research (e.g., an observational study to establish the pattern and an experiment to evaluate mechanisms) that can be accomplished in 2-3 field seasons.

Then, **BI's**. Ideally they can build off of things you've already done (**credible**), be specific about things that you'll do (**concrete**), and creative. If there are specific programs at MSU that you can work with, these are great - credible and concrete. Remember, each panelist will read 30 applications and many will propose very similar BI's (work with undergrads, made data publically available - both good, so don't necessarily avoid...). But, how will you stand out (**be creative**)? Recruit students from under-represented backgrounds. But how, exactly? And how can you articulate BI's impacts in a way that makes clear the outcomes/impacts they will have? Also, make these realistic. Too many and you lose credibility. Too few and you come off as light (also not credible in your dedication to BI's). I like 3 or 4 strong BI's.

### **How best to address Intellectual Merit and Broader Impacts?**

Address in both statements explicitly. Most applications will have **headers** for each, in each statement and I think this is a good idea. It can also be helpful to build **linkages** between the IM and BI's in the two statements. Remember, you are ranked as an applicant (i.e., your statements are read and ranked in isolation), so make your application a package. Building linkages reinforces talking points and establishes credibility. For example, say you mentored incoming students as a senior undergrad and describe this in your personal statement. In your research statement BI's, you could then say "I will build off my past experiences with mentoring undergraduates to...." This will be very credible. Now, make it concrete. Same goes for research - works well to propose research that links in some way to the sorts of things you've done in the past.

**Closing thought.** I'm really glad you're applying to the GRFP. It's a fantastic opportunity - both for the funding (which is great), but also for you to step back, think about, and then articulate what you're all about as a scientist, as well as gain experience with putting together a compelling proposal. Good luck!