REU application suggestions

A Brief and Unofficial Guide to REU applications

The application process for undergraduate research programs is confusing to many. It is probably your first exposure to a semi-realistic academic application, in which many qualified applicants compete for a relatively few available slots for a granting agency. You are likely looking at a program with hundreds of applicants and perhaps ten slots available. Furthermore, everyone who is applying has somewhere between a good to great academic record, often with tons of related experience and glowing recommendations from faculty.

You have one opportunity to stand out that is entirely within your control, and that is your essay or personal statement. Frustratingly, this is often the most neglected part of the whole application. Applicants enthusiastically recap every vaguely science-related thing they have ever done, while finishing their statement with a throwaway sentence with "I feel that the summer research program at [COPY-AND-PASTE PROGRAM NAME HERE] will be an outstanding experience for me to progress as a scientist."

No. This is wrong. We already know about everything you mentioned, your good grades, your genetics professor who loves you, your "passion for science." (everyone has one of those, they must hand them out at the door) We know this because it's covered in the rest of the application. We want to take away three things from your essay: 1) How likely is it that you will go on to graduate study in the sciences? 2) What is the level of your interest, personally, in doing scientific research or education (including secondary education in science) as a career? 3) What is it about *our program, specifically*, that makes you want to apply *here* rather than to some other SURF-type program? Flavor text regarding how much you Are Passionate For Science, and description of your childhood formative experiences, are nice but should be kept to about one concise and professional paragraph early on in the application essay. It is also important not to come across as flaky; excessively emotional language, particularly in programs geared to field or environmental research, will do you no favors. We want to see that you are ready to assume the duties of a junior scientific researcher.

The nature of the NSF REU program is such that the future success of the grant will be evaluated on the first two points. In other words, we are actively trying to weed out people who are headed to medical or other professional health schools, unless they are bound for MD/PhD programs or the like. More obviously, we are trying to weed out people who won't be able to handle the responsibility of a real research job, or who will treat the gig like it's a paid summer vacation. Please, if you are one of these people, do something else. The REU is prestigious, but it won't help you get into med school as much as a summer of working in a hospital or clinic. Med schools are very good at detecting and ignoring people who are prestige-seekers rather than people legitimately preparing for a medical career.

The most neglected part is the third point. If you apply to a REU, you should have done at least an hour or two of research on the institution's website. You should have identified one to three researchers at the site whose work interests you. You should have at least skimmed some of their published work, and by this I mean the peer-reviewed papers they have published. In your essay, you should **mention them by name** and explain what about their work intrigues you.

It is also appropriate for you to contact them via email **before your application is sent in** and explain that you are considering applying for an REU with them. Selecting a summer student is a difficult and chancy process for the PI of a lab, who has many other duties. The PI (and the grad student or postdoc who will be supervising you directly) needs to know that they will be getting something for their investment; they need to be convinced that at the end of the summer, they have a pretty good shot at getting publishable data out of you. It is your job to convince them of that.

One final thought: the other area which you control is your letters of recommendation. The first and most important thing which I must emphasize is to **make sure your letter writer will write you a good, enthusiastic, and detailed recommendation**. Obvious? Yes. But I have read several recommendations which were obviously written by an instructor who had a mediocre opinion of the applicant and had little interaction with him or her. I have even read negative letters which criticized and belittled the applicant. Do not ask for a letter from anyone who does not know you well. Do not ask for a letter from an instructor in whose class you didn't excel. In order, you should seek letters from the following:

1. Someone who has directly supervised you in a research setting.
2. The PI of a lab in which you did research, who interacted with you often but did not directly supervise you.
3. Your supervisor in a job which has skills that translate to research, but was not directly a research job.
4. Your science instructor in an independent study course or an upper-division course, in which the class was small enough that you regularly had one-on-one interactions.
5. Your science instructor in a large class that did not involve one-on-one interactions, but in which you distinguished yourself by your work.
6. The head of your honors college or department, your academic advisor who does not have an interaction with you in other ways, or other academic personnel who know you.
7. Your supervisor from a non-science-related job.

Once again, all these are assuming that **the person in question thinks highly of you and will write you a very positive letter.** You are much better off going down a few categories to find someone who loves you and thinks the world of you,

than you are with someone prestigious who will write you a lukewarm recommendation.

Don't despair if you don't get it on the first try. Often these experiences are set up with a specific intent to the grant; they are targeted to ethnic minorities, or to rising seniors, or to a particular major. Your sure ticket to getting research experience is to pay your dues. If you don't have any, go to a professor in your department whose work interests you and work out an arrangement to do research for credit. If you are at a tiny school with no research, find a bigger one in your area. If you are in the boonies, email a professor at your state school about doing data analysis or computations or something for them. A paid summer research internship is the top of the line gig in undergraduate research; unpaid or hourly work in a lab at your own school is the place to start. If you are too busy with organizations, athletics, or other college stuff to do this, you need to recognize that you set your own priorities and ask what is the top priority for you.

If you are located at a school which just doesn't have good research opportunities no matter who you ask, this is okay. You should still position yourself to succeed as best you can by participating in independent study or seminar-type classes, directly interacting with instructors about the material, and seeking work which builds research-related skills so that we will be able to identify you as a good candidate. However, a main purpose of the NSF REU is to provide students in your position with an experience in a top-flight research lab. A certain number of our positions are deliberately given every year to students who do not have access to research facilities. If you can make a case for yourself in other ways - strong recommendations, adequate academic record, and well-explained interest in your target lab - you will be a good candidate for an REU.

While reading the above guidelines, you may have thought to yourself "This is way too much work. Doesn't this guy know I have to apply to 10 of these things? I don't have time!" **That is the point. You shouldn't apply to 10 of these things.** You should identify one program that you would really, really be over the moon if you got into, (your "reach") and one program that you would be excited to go to and that would be a really solid step in your career (your "safety") and apply to those only. Think Harvard for the former, Penn State for the latter if you're an A student; Virginia for the former, WKU for the latter if you're a B student. Also look into federal labs as well as universities, they offer excellent programs and can offer direct employment opportunities after school.

Good luck!

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