Getting Started in Undergraduate Research in Biology

Imagine being the first person in the world to see a new result! Research is rewarding, but it also requires commitment. At Emory, there are many ways to do research at Emory, at surrounding institutions (Yerkes, CDC, the VA Hospital, etc.), or at other schools. You can perform the research either as a volunteer or for credit, rarely for pay, during the semesters or the summer. There are many types of research. You should not feel limited solely to bench work; you can work on clinical or epidemiological studies at the Rollins School of Public Health or the CDC. One student even did research for credit with the Fulton County Department of Health.

There are several main issues of beginning research: 1) with whom, 2) how, 3) when, and 4) where you want to fit research into college.

1. WHO?

To find a research mentor, first decide what you are interested in and then find people that work on it. Don't depend on any list of folks you find online. Just go out and get one! See a list of possible sources below as a start. You should ask your friends and other instructors to identify people with whom you might like to work. Departmental websites are good sources of research summaries.

- Biology Department: http://www.emory.edu/BIOLOGY
- Graduate Division of Biological and Biomedical Sciences (GDBBS): http://www.emory.edu/Biomed/GraduateDivision
  You can (and should) search the research descriptions of researchers in the GDBBS by either keyword or by searching for words in their research summary. Note that this will only search those faculty that are members of the Graduate Division (which includes College and Medical School faculty).
- Yerkes: http://www.emory.edu/SPH/YERKES
- Winship Cancer Center: http://www.winshipcancerinstitute.org
- CDC/ATSDR: http://www.cdc.gov/Fellowships/StudentInternships.html
- EPA: http://www.epa.gov

Once you have identified a few (~5) possible mentors, you should do some preliminary research into their work by visiting PubMed or Web of Science http://www.ncbi.nlm.nih.gov/Entrez/medline.html http://pid.emory.edu/ckpw6 and searching for their publications (). You may not understand the details but you will get the gist of it by reading the abstracts. After you have looked at their work, you should email to request an appointment to speak with them. Before your appointment, read more about the researcher's work so that your discussion is somewhat informed. The discussion section of the most recent papers will give you and idea of what they are working on currently. When you meet with them, if you have a good feeling about their leadership and their lab, ask if they are interested in undergraduates doing research in their lab. Better to do this in person than via e-mail.

When you speak to a researcher, be advised that the researcher will be more interested in your working for him or her if you are making a long-term commitment. It takes a lot of training for an undergraduate to be productive in a lab. The researcher must be committed to undergraduate education to be willing to spend that much time training you. For example, if you do research for credit (Bio499), you will be working for at least two semesters. Or you could combine a semester of volunteering with a summer SURE fellowship.

Also, when you speak to the head of a lab, be prepared to give them some names of your past professors who can reflect on your abilities and commitment. Your grade is not always the most important aspect. It also matters whether you were a curious and diligent student who can work well with others. You will be much more attractive to the researcher if one of their colleagues can vouch for you.

Summary: It is hard to contact researchers cold, but the perseverance it takes to make the connection reflects your commitment to do the research.

2. HOW?

You can perform the research either as a volunteer or for credit or through a paid program/internship or rarely for salaried pay.

VOLUNTEER

If you decide to work as a volunteer first, you should make sure that you commit to only the amount of hours that you are able to do NO MATTER WHAT. Many folks make the mistake of volunteering for too many hours and then get busy and can’t show up. BAD IDEA. Much better to under estimate what you can do and then show up MORE. For example, it is very hard to gauge how busy you will be in your first semesters here at Emory.

PAID

It is possible to get paid for research. The rules are that you can’t get both money and credit for the same work. Many students start out in a lab working as a work-study. Be sure to mention if you have work/study status when you speak to labs about a position (see a list of positions at https://emory-csm.symplicity.com/students). In such a job, you will be doing lab maintenance, but it could morph into a research job. CDC offers some paid summer positions. You should be able to find out about them through their website (http://www.cdc.gov). Some of the scientists on campus will hire summer help as well, depending on their grant support.

PAID PROGRAMS

The Howard Hughes program, run from the Center for Science Education in Emory Village, is responsible for organizing the Summer Undergraduate Research Experience (SURE) program. In this program you would perform research over the summer and earn a stipend.
This is a competitive program, and the applications are due at the beginning of February! You can learn more by visiting the SURE website at http://www.cse.emory.edu/projects/students/sure.html . There is also a list there of possible mentors but do not be limited by that list. To apply for this program, you work with a researcher to submit a proposal.

Another program is the Scholarly Inquiry and Research Experience (SIRE) program for beginning and advanced researchers http://college.emory.edu/home/academic/research/sire/index.html. The Research Partner matches sophomores and juniors with a lab where they are get credit or pay to work 10 hours a week for two semesters. This is a good way to gain an introduction to research. The deadline for this program is ~ May for the fall. SIRE also gives grants to more advanced researchers to defray some of the research or travel costs (deadlines twice a year).

CREDIT
If you decide to do research for credit, you would sign up for Biology 499R. To enroll in this class, you must be a Biology major and you must do research for two semesters. The details about the class can be found at the website for the course http://www.biology.emory.edu/research-opportunities. When you are accepted into a lab, you would fill out a 499 application and turn it in to Rachelle Spell. You are expected to work 3-4 hrs in lab/wk/credit hour. That would be 12-16 hrs/wk (sometimes 20) for a 4-credit class. 499 requirements also include a paper on your work every semester and, in the spring, the presentation of your work in a poster at the Biology Undergraduate Research Symposium.

Grading expectations are on the website. You should have a sit-down with your mentor to discuss what is required/expected of you. It is important to know the ground rules before you start so that there will be no hurt feelings. Some things that you might want to do as part of your grade (besides lab work) include going to lab meetings and presenting your work, presenting at research meetings or campus symposia, and meeting at least weekly to show your lab notebook to your mentor.

You should know that the Biology department counts 499 credits (maximum of 4) towards an elective and an upper-level lab for the Biology degree.

One final note: If you have a 3.5 GPA and are a junior, you may want to apply for the Honors Program http://www.biology.emory.edu/honors. This is a more intensive research experience that involves writing a thesis and presenting your work to a committee of faculty (that you choose). You also need to take a graduate level course. The program leads to graduation with Honors and is run by Dr. Arri Eisen. More can be found on the Honors pages on the Biology Department site. Honors students often begin a relationship with their honors lab during earlier semesters as a volunteer, as a Bio499 student, or as a SURE fellow the summer before their senior year.

3. WHEN?

Unless you already have research experience and an extensive science background, it is not a good idea to try to do research your first semester at Emory. You are still learning to juggle classes, studies, and extra-curriculars. Also, professors will often require some prerequisite course knowledge before accepting you into their lab. However, use your first semesters to meet your professors and discuss with them your interest in research. You can make connections that can lead to research opportunities in later semesters.

If you are interested in applying for the SURE fellowship, you should make arrangements before the Winter Break to work with a research mentor in order to be able to write your research plan and submit it before the early February SURE application deadline.

4. WHERE?

There are many, many summer research fellowships/internships at other schools. Many students desire to do research at another institution because of the proximity to home, because of interest in the destination city or school, or because of a particular interest not fostered at Emory. This can be a great opportunity. Most applications are due in the first half of the spring semester. Look at the schools' websites to find lists of such opportunities. Keep in mind, however, that such fellowships are often very competitive for students that do not go that school. The best chance for success occurs when the student has made a personal effort to connect with a researcher at that institution, when the student is an under-represented minority, or when the student has a special, documented interest in a particular area (e.g. marine biology). In other words, your success is directly proportional to your sincere interest in that area of science.

IN CONCLUSION:

Scientific research is not something to do in order to check off a box on your resume. It is something to do to see first-hand how science advances, to apply class learning that really interests you, or test out your fit for a research career. You cannot really experience research in your spare time or on top of a full load. However, you will get a tremendous amount of personal growth, hands-on learning, and academic support when you do something you are genuinely interested in. Putting in the effort to make a good fit will reap benefits for your development and your career in the long term.

Contact me if you have additional questions,

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