

# Getting Started in Undergraduate Research in Biology

Scientific research is rewarding, but it requires commitment. It 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 that genuinely interests you. Putting in the effort to find a good research fit will reap benefits for your intellectual development and your career.

There are many opportunities to do research at Emory University, at surrounding institutions (Yerkes, the CDC, the VA Hospital, etc.), or at other schools. You can perform research either as a volunteer, for credit, or 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.

There are several main issues that you must consider when beginning research, including WHEN, WHERE, WHO and HOW:

## WHEN should you conduct research?

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-curricular activities. Furthermore, some professors may require specific prerequisite course knowledge before accepting you into their lab. Use your first semesters to meet your professors and discuss your interest in research. You can make connections that can lead to research opportunities in later semesters. Once you start conducting research, trying to make a long term commitment to it playing an integral part of your remaining undergraduate career.

## WHERE and with WHOM to conduct research

### RESEARCH AT OR NEAR EMORY

To find a research mentor at Emory, first decide what you are interested in and then find people that work on it. 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.biology.emory.edu/>
- Environmental Sciences Department <http://envs.emory.edu/home/>
- Graduate Division of Biological and Biomedical Sciences (GDBBS) <http://www.biomed.emory.edu/>. Search the faculty research descriptions by either keyword or by searching for words in their research summary. Note, this only searches those faculty that are GDBBS members, which includes many, but not all, College and Medical School, and Public Health faculty with biology-related research labs.
- The Rollins School of Public Health. <https://www.sph.emory.edu/>
- Yerkes <http://www.yerkes.emory.edu/>
- Winship Cancer Center [www.winshipcancerinstitute.org/](http://www.winshipcancerinstitute.org/)
- The Centers for Disease Control and Prevention (CDC) <https://www.cdc.gov/fellowships/short-term/index.html>

Once you have identified at least five mentors, you should do some preliminary research into their work by visiting [PubMed](#) or [Web of Science](#) to search 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 these papers, you should email to request an appointment to speak with them. **In this email, be very specific about why you are interested about their work.** If you do not hear back, you should try a second time, being polite but indicating your enthusiasm. Before your appointment, read more about the researcher's work so that your discussion is somewhat informed. 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. It is better to do this in person than via e-mail.

It can be hard to contact researchers having never met them, but the perseverance it takes to make the connection, and your interest in their work and the field, reflects your commitment to do the research. 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.

## RESEARCH ELSEWHERE

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. There are numerous summer research fellowships/internships at other schools, and many researcher may accept summer volunteers. For summer program, application deadlines range from December until March. Look at the schools' websites to find lists of such opportunities. You can also search for programs funded by the National Science Foundation at [https://www.nsf.gov/crssprgm/reu/list\\_result.jsp?unitid=5047](https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=5047). Summer fellowships are often very competitive. The best chance for success occurs when the student has made a personal effort to connect with a researcher at that institution (see tips above for contacting researchers), when the student is from a background under-represented in science-related fields, or when the student has a special, documented interest in a particular area (e.g., marine biology or public health bioinformatics). Your success is directly proportional to your sincere interest in that area of science, and to the effort that you put in to apply for multiple programs that match your interests.

## **HOW to conduct research at Emory?**

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

### **VOLUNTEER**

This is often the best way to start. **You should make sure that you commit to only the amount of hours that you are able to do.** Many folks make the mistake of volunteering for too many hours and then get busy and cannot show up. It is much better to underestimate what you can do and then show up MORE.

### **PAID**

It is possible to get paid for research, **though you cannot get both money and credit for the same work.** Many students start out in a lab through 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 on <http://studentaid.emory.edu/types/fws/search.html>). In such a job, you will be helping with lab maintenance, but it can morph into a research position, particularly if you make it clear that you would like an opportunity to conduct independent research in the future. CDC offers some paid summer positions (see above link). Some researchers on campus will hire summer help as well, depending on their grant support. These positions are often available for undergraduates already in the laboratory. If you are in a laboratory, it good to ask directly if you are interested.

### **CREDIT**

If you decide to do research for credit, you will sign up for Biology 499R. To enroll in this class, you must be a Biology major and you must do research for two semesters. Details about the class can be found at [www.biology.emory.edu/research-opportunities](http://www.biology.emory.edu/research-opportunities). When you are accepted into a lab, you must complete the 499 application to submit at 499 Registration meetings at the beginning of each semester. You are expected to work 12-16 hrs/week. 499 requirements include four course meetings with monthly assignments culminating in a research report every fall and a poster presentation at the Biology Undergraduate Research Symposium every spring. **After two semesters of 499, one of the 499 courses will count as an elective (with upper level lab) toward the Biology degree.**

### **HONORS**

If you have a 3.5 GPA and are a junior, you may want to apply for the Honors Program, [www.biology.emory.edu/honors](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. You must also take a graduate level course. The program leads to graduation with Honors and is run by Dr. Arri Eisen. Biology honors students often begin a relationship with their honors lab during earlier semesters as a volunteer, as a Bio499 student, or as a SURE/SIRE fellow.

### **FORMAL EMORY PROGRAMS**

The Office of Undergraduate Education (OUE) runs the **Research Partners Program** (<http://college.emory.edu/undergraduate-research/opportunities/research-partners-program.html>). You can receive credit or, if eligible, be paid through work-study. The program is available to rising second and third year students. Students do not need previous research experience and do not need to have identified a research mentor in advance. The application for the program is typically in May.

The OUE also runs a 10-week long, paid **summer program**, The Natural and Biomedical Sciences Program (<http://college.emory.edu/undergraduate-research/summer-programs/natural-biomedical-sciences/index.html>). This program is highly selective, and you must work with an identified mentor to write an research proposal for your application. Applications are due near the very beginning of the spring semester.

**For additional questions, contact:** Dr. Nicole Gerardo, Director of Undergraduate Research in Biology Rollins Research Center (RRC), Room 1111, [ngerard@emory.edu](mailto:ngerard@emory.edu)