

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 to 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.) and at other schools. You can perform research either as a volunteer, for credit, and (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, for example, 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. Some professors may require specific prerequisite course knowledge before accepting you into their lab, and others will not. 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, try to make a long-term commitment to it.

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.

- 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, Emory faculty with biology-related research labs.
- College Departments
 - Biology Department <http://www.biology.emory.edu/>
 - Environmental Sciences Department <http://envs.emory.edu/home/>
 - Also look for faculty associated in Physics, Chemistry and Computer Science with biology-associated research.
- The Rollins School of Public Health. <https://www.sph.emory.edu/>
- Yerkes <http://www.yerkes.emory.edu/>
- Winship Cancer Center <https://winshipcancer.emory.edu/research/index.html>
- The Centers for Disease Control and Prevention (CDC) <https://www.cdc.gov/fellowships/short-term/index.html>
- Marcus Autism Center <https://www.marcus.org/autism-research/autism-research-team>

CONTACTING RESEARCHERS

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 an overview by reading the abstracts. After you have looked at these papers, you should email to request an appointment to speak with them or someone in their lab about their research. Suggest that you would be willing to meet with them even if there are not undergraduate research opportunities immediately available. **In this email, be very specific about why you are interested in 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 in the lab 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 OUTSIDE OF ATLANTA

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 researchers may accept summer volunteers. For summer programs, 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. 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, which can make it feasible to balance the time commitment necessary for research and work. 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. Biology 499R is only for Biology majors (or those who intend to declare a biology major). To receive credit towards the biology major, you must do research for two semesters. Details about the class can be found at www.biology.emory.edu/research-opportunities. When you are accepted into a lab, you must complete the 499R registration in order to receive a permission number to register for the course. You are expected to work 12-16 hrs/week. 499R requirements include attending occasional workshops with regular assignments culminating in a research report every fall and a poster presentation at the Biology Undergraduate Research Symposium every spring. **After two semesters of 499R, one of the 499R 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. 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. Alex Escobar. Biology honors students often begin a relationship with their honors lab during earlier semesters as a volunteer, as a Bio499R student, or as a SURE or Research Partners Program (RPP) fellow. See below for more information on these programs.

FORMAL EMORY PROGRAMS

The Office of Undergraduate Education (OUE) runs the **Research Partners Program (RPP)** (<http://college.emory.edu/undergraduate-research/opportunity/research-partners.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 due in May.

The OUE also runs a 10-week long, paid **summer program**, the Summer Undergraduate Research Experience (SURE) program (<http://college.emory.edu/undergraduate-research/summer/index.html>). This program is highly selective, and you must work with an identified mentor to write a 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
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