

Undergraduate Research Opportunities in the Biological Sciences

What kind of research opportunities exist on campus? Research opportunities are available in many different labs on campus. These include faculty labs in the Division of Biological Sciences, as well as in the College of Agriculture & Environmental Sciences. There are also many faculty that are associated with the School of Veterinary Medicine and the School of Medicine.

Are these positions paid or volunteer? There are opportunities of both types. Paid positions would be advertised at the Student Employment Center. More opportunities are available as volunteer positions, for which you can obtain unit credit. The Internship and Career Center also has listings for paid and unpaid internships off-campus.

How do I obtain units for my research experience in a lab on campus? After you have identified a lab to work in, you can sign up for independent study units (193, 199 etc) in the academic department with which your professor is affiliated. You should contact the undergraduate advising office in that department to obtain the paperwork and a CRN number. Three hours of work in the lab per week during the quarter is equated with 1 unit of credit. Off-campus internships can also be done for unit credit...see the ICC. Many departments also offer Honors research courses (194H). These are usually done after you already have some 199 experience and usually include completion of a written thesis describing your work.

How much time will undergraduate research take? The answer to this question depends on the lab and project that you are working on. This is something that you should discuss with your professor so that you both have the same expectations about the experience. It is definitely true that the benefits that you receive from the experience are proportional to the time that you invest. In general you should expect a weekly minimum investment of 6-9 hours per week. The experiments may also require that you spend more than your average time during some weeks, and that you come in to the lab at odd hours in addition to your regularly scheduled time. Some professors may want you to be able to commit more than one quarter, so that you have an opportunity to really accomplish some meaningful work on your project.

Do I need to have prior experience? These opportunities are intended to provide you with lab experience...you aren't expected to be experienced already. However, some professors may want you to have taken some appropriate preparatory coursework or lab classes so that you will better understand the research that you will be doing.

How do I locate a lab in which to work? This will take some effort on your part. There is a general listing of undergraduate research opportunities in biological sciences labs on campus, maintained by the College of Biological Sciences (<http://biosci2.ucdavis.edu/BioSci/URO/index.cfm>). This will list general types of research done in a lab. At any given time, these labs may not have space available, so you must contact the professors to set up an appointment to talk about research opportunities. You can also visit the websites for graduate programs in the biological sciences and look at the lists of faculty and their research interests (<http://www.gradstudies.ucdavis.edu/programs/index.cfm>). After you have identified interesting labs, a phone call or visit to the professor's office to ask for an appointment may be more effective than email.

What should I do to prepare for an interview for a lab research position? It is useful to bring a resume or a short list of relevant courses you have taken (and grades), prior jobs (even if they are not lab related they can demonstrate your ability to handle details, organizational skills, ability to work as a team member etc), and perhaps a paragraph describing your future career goals/why this research experience will be useful to you. Think about your time availability (how many quarters you would like to commit, how many hours do you have available and how is your time arranged around classes, etc). It is also a good idea to look up some research publications from the lab (on Medline at the library or by using Pubmed <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed>); do an author search with the professor's

name). This gives you an idea of the actual work that is currently going on in the lab and provides an opportunity for you to discuss specifically the projects you would be interested in. It also sets you apart from other students that may not have made the effort to do any background research.

What will contribute to a successful experience in research? You will have the best experience if you become intellectually involved in your project. Don't view it as a typical lab course where everything will be prepared for you and set up so that it will work. Note that this is independent research. This does not mean that you have to figure everything out on your own, but it should be an opportunity for you to think about how to plan your own experiments and time. You will benefit from doing some additional reading in the areas related to your project. You can ask your professor or other people in the lab for some suggestions of papers to read. You can also find background material on your own by using Pubmed and Medline. You may even come up with some new ideas that your lab has not tried yet! Keep an accurate and detailed lab notebook to record your experiments and to write down instructions, protocols, and where important reagents and equipment are located. Watch and learn from others in the lab; talk to them about their projects. Don't be afraid to ask questions...it is much better to ask than to break a piece of equipment or have to redo the experiment later. Take your project seriously. In most labs, you will be given a "real" project that has importance and significance for the work going on in the lab. This means that the results are important to your professor. If midterms or other commitments during the quarter make it impossible to complete some work that you have started, discuss this with your professor or supervisor in the lab so that the work will not be lost. Most people are understanding if you are responsible and discuss any problems with them.

Other opportunities related to independent research:

See the campus website about Undergraduate Research for additional information:

<http://undergraduateresearch.ucdavis.edu/faculty.html>

(1) Honors research (194H): As mentioned above, this is an opportunity for more advanced students to learn to summarize their research in the form of a written Honor's Thesis. This can provide Honor's notation at graduation (check with your major program for details of how the program is administered in your major).

(2) Undergraduate Research Conference: Each spring a research symposium on campus features the work of undergraduate researchers in many fields. This is a good opportunity to learn how to present your work as a research talk or poster. For more information see <http://urc.ucdavis.edu/>

(3) President's Undergraduate Fellowship: Students conducting independent research can apply for funds to support their research projects (usually up to \$2000). The money cannot be used for salary but can make it possible to purchase supplies that are needed for your project. Since this is a competitive award, it is a nice accomplishment to add to a resume.

http://undergraduateresearch.ucdavis.edu/pres_fellowship.html

(4) McNair Scholar's program: This excellent program is designed to enhance the opportunities for students to continue in a career in research. To be eligible you must have >90 units, 3.0 GPA, intend to pursue a Ph.D. (not a professional degree), be a first generation college student and economically disadvantaged OR a member of a group underrepresented in graduate education. For more information:

<http://www.mcnair.ucdavis.edu/> . For additional opportunities for underrepresented students see <http://undergraduateresearch.ucdavis.edu/camp/>

(5) Programs off campus: There are some opportunities for off-campus research during the summer and the school year at various institutions around the country. For instance, for opportunities at the National Institutes of Health see <http://www.training.nih.gov/student/index.asp> You can watch for postings and ask your professors about other opportunities that they are familiar with. Also see

http://undergraduateresearch.ucdavis.edu/off_campus.html

(6) Summer research programs: Programs are available during the summer both on and off campus. For example, see the SURF program at UCD <http://undergraduateresearch.ucdavis.edu/surf.html> or see this link for information about summer research programs elsewhere <http://undergraduateresearch.ucdavis.edu/summer.html>