Research 101:

a student-to-student guide to everything you need to know about undergraduate research at Cornell

An Independent Student Publication
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The Cornell Undergraduate Research Board (CURB), is an organization dedicated to enhancing the Cornell University undergraduate research experience. CURB is committed to fostering academic excellence through undergraduate interaction at events that bring student endeavors to the forefront of the Cornell community’s attention.

CURB’s key event is the annual spring undergraduate forum. For more than 20 years, hundreds of undergraduates from all majors and disciplines have presented their hard work in the undergraduate forums. In addition, keynote speakers, including Bill Nye (College of Engineering, 1977), have shared words of advice to help guide the Cornell research community on the path to the future.

There’s no typical undergraduate experience, and similarly there is no typical undergraduate research experience. CURB’s mission is to help undergraduates with a nascent desire for research find their niche at Cornell; a process that we hope aids them in defining themselves and their dreams for the future.

If you would like to become a member of CURB, send an e-mail to curb@cornell.edu, and you will get placed on the listserv. For news and events, visit our website http://www.research.cornell.edu/curb.
Before you get started in “research,” it is important to identify your goals and objectives in this pursuit. What are your expectations for becoming involved in college-level research projects? How committed are you to a project in terms of time, energy, and enthusiasm? How will you evaluate your experience? Knowing what you can contribute and what you hope to develop through research will not only help you to find a great position, it will help you make the most of it.
Tips on Getting Started with Science Research

• Some students are lab assistants and make solutions and wash dishes, but don’t do research. However, if you need $$$ this is a good way to get your foot in the door. After you finish washing the dishes, start asking people in the lab (when they aren’t busy!) what they work on.

• Some students are hired as assistants to help faculty, graduate students, postdocs, and technicians do work. These students often learn one technique (PCR, DNA mini-preps, etc) and do that on a lot of samples. Again these positions are good if you need pesos, and will teach you how to do a number of techniques.

From Research at Cornell University in Biological Sciences

Tips on Getting Started with Social Science or Humanities Research

We often hear that it is harder to get involved with social science or humanities research than research in the life and physical sciences.

Why is that?

• Often students with interests in the social sciences or humanities have a harder time narrowing down their interests so it makes figuring out where to start that much harder.

• Students feel that if they don’t know EXACTLY what they want to do and have a specific project in mind that they won’t be able to get started.

• Faculty in these areas may not be as accustomed to working with undergraduates and thus may be less amenable to doing research with freshmen. These faculty may be more accommodated to working with graduate students who have a very particular topic in mind.

• Many students strongly associate research with joining a lab, sitting at a bench, and running experiments.
Here are some suggestions, helpful hints, and tips from students who have successfully completed research in the social sciences and humanities.

“Approaching a faculty member whose class you have really enjoyed about doing research with them is a good way to get involved with a project because you know the faculty member’s style and they are familiar with your work from class.”

“You may find that you are expected to work more independently than students in science-based labs. Often you may do a great deal of work on your own and then meet every week or every other week with just the faculty member.”

“There are plenty of faculty at Cornell doing ss/hum research. And there are plenty who are willing to work with undergrads and who even seek them out. A faculty member who seems unwilling to work with an undergrad will probably not be a very good faculty mentor.”

“Don’t feel that you have to start working with a faculty mentor whose interests are exactly the same as yours. Choosing to work on a project that you are somewhat interested in but that will give you great experience is a really good idea. Especially if the faculty member or another individual working on the project spends a lot of time with you so that you get a lot of training and support. Who knows you may decide that the project is more interesting than you originally thought.”

“Work on any kind of project is valuable because you learn things that you did not know and you also begin to figure out what you like and don’t like.”

“You definitely do not have to have a project all figured out and know exactly what you want to do. Choosing a position where you can get your feet wet can be a very good way to start.”

“Participate in undergrad activities such as the Cornell Undergraduate Research Board and the Research Paper to help promote social sciences/humanities research at Cornell.”

From CPRS Tips on getting started with social science or humanities research.
Q: Why should I do research as an undergraduate?
A: Undergraduate research (1) teaches you about a field you are interested in (2) helps you define your own style. There is no one reason for doing research. Hundreds of students would tell you a myriad of answers. Rather, UR is an enriching process by which you gain skills.

Q: I’m not a scientist or an engineer. Can I still do research?
A: Absolutely!

One of the greatest myths about research is that it involves supercomputing and lots of test tubes. The truth of the matter is that research is limitless and has unbelievable freedoms. Professors in the humanities and social sciences have supported undergraduate research for years. There are also many interdisciplinary projects that transcend departments.

Q: Do I have to wait until I’m an upper class student to conduct research?
A: No. Many freshmen and sophomores decide to explore their options by volunteering in labs and networking, and many professors actually prefer underclassmen because they have more years ahead of them. Through this process, they develop the necessary skill set to move on to the positions that really interest them during their junior and senior years.

Take your schedule into consideration and allow yourself a nice transition. Get involved in undergraduate research when you’re ready.

Q: What if I have my own project in mind?
A: Make use of Cornell’s resources and pursue an outlet for your interests. Your goal is to find someone to help you with your project by first developing your interests.

The first step involves you becoming familiar with your field of interest. You’d benefit from taking classes that relate to the project you someday hope to complete. This will introduce you to the elementary material and to the professors who love the subject. Read on your own, attend lectures on campus, and speak with faculty. Eventually you will find someone who works in your field of interest and may even take you under his or her wing.

Once you’ve proven your interest and commitment, he/she may help you with that project that got you started in the first place. Along the way you’ll have gained a much broader understanding of your project.

Q: How do I find out about research opportunities?
A: Keep your eyes open.

If you ask any Cornell researcher on campus where they found their job, chances are they’ll tell you a story full of persistence on their part, and often, a friend of a friend. Research opportunities are posted on student listings through uPortal and in different departmental offices. In addition there are many useful research websites. Check out the undergraduate research website at http://www.research.cornell.edu/undergrad/. Often positions will be posted in classified ads.

Many times students can even find research opportunities through speaking with their professors. They may start out doing background research for the professor and eventually it could lead to greater things. Sometimes professors will announce in class that they need help.

More valuable resources, however, are fellow students. Networking is a great tool that enables you to learn about the opportunities immediately available. Join student organizations such as the Cornell Undergraduate Research Board to hear about what students do under the leadership of faculty members. They’ll be more than willing to share their stories about how they got involved.

Q: How do I find a faculty advisor for my project?
A: Just like finding an opportunity, you must network to find an advisor you are comfortable with.
Your faculty advisor not only has the commitment to help you learn, she/he will become your friend.

Some students work well with constant direction and others work with almost none. You’ve got to identify someone you can trust. Generally, professors that you’ve had in class are a great place to start. You may also consider asking researchers who their faculty members are and consider joining their team.

Q: How do I know what faculty are doing research?

A: Take the initiative to do your homework.

Faculty are involved in dynamic work that changes from day to day. There is, usually, a theme and particular niche in which a given faculty member will work. This is what you must look for.

Start by visiting department websites, which will contain a list of faculty and brief bios. Read about their publications and in that way you’ll learn about what they’ve done. Occasionally, however, there are those faculty who have research interests that are not so obvious. You already probably read articles that pertain to stuff you’re interested in so keep an eye out for Cornell faculty.
Q: Can I do a project outside of my home department?

A: ABSOLUTELY!

Cornell, with a strong focus on research, has ample opportunities to pursue any and all interests. Taking time to pursue research outside of your major and department is a great chance to explore and become a well-rounded student. Often, you’ll learn that the techniques and principles applied in a given field relate to the one you are studying. Interdisciplinary synthesis is a powerful tool that you will develop, and it is a skill that will be called forth once you leave Cornell.

Q: Can I get credit for my research?

A: Yes.

Students either volunteer for free, are paid by the faculty sponsor, or earn academic credit. All arrangements are made between you and the faculty member. There is no true structured program, but rather a lot of flexibility in compensation.

Pay is usually through the Cornell On-Line Timecard System (COLTS) through Bear Access. Your supervisor can sign you up on this system at a given pay scale.

Credit depends on the department. Many departments have upper level courses, generally 499, through which students earn variable credit. Check with your faculty sponsor regarding the amount of credit you should earn.

Q: How can I get funding?

A: Well-developed ideas have little problem finding funding at Cornell. A faculty advisor will be your best resource in this regard.

Requesting funding is an important skill to develop. Each college offers funding opportunities to all students. With an open application process, funding applications generally require a proposal and faculty advisor support. It’s a collaborative process that is well worth the experience. Visit your undergraduate field office for specifics regarding programs and application requirements.

Funding can also come from external resources. Professional societies (American Society of Mechanical Engineers, etc.) offer scholarships for student papers and work. A faculty advisor is a great help in applying for these prestigious awards.

Refer also to the undergraduate research website, http://www.research.cornell.edu/undergrad/, which has lots of links to funding. Summer funding and opportunities are more plentiful than during the academic year. Deadlines are often in February and March- so start early!

Q: How much time will a project take?

A: It depends.

When you initially consider becoming involved in undergraduate research, you should think about the level of commitment you are willing to put in. Undergraduate research is a mutual arrangement between you and your sponsoring faculty advisor.

Some students work in excess of twenty hours per week; generally they are working towards an honors thesis or for credit. Students volunteering in a lab may work about two to three hours per week. You must simply communicate what you want to learn and make sure that you are in control of personal time management.

Q: Does undergraduate research help me get into graduate school?

A: Don’t come to Cornell and do undergraduate research if your intention is to get into a great graduate or professional school. You would miss out on the Cornell undergraduate experience if you did that. Undergraduate research is not a stepping stool. It is not a requirement but rather an opportunity for you to learn about yourself. More importantly, you will become more knowledgeable about your research skills and personal qualities.

From http://www.research.cornell.edu/undergrad/ by Dean Marilyn Williams
So yes, undergraduate research will help you get into graduate school by identifying your strengths and interests.

But no, undergraduate research won’t simply get you in because you’ve gone through the motions. Undergraduate research is an invaluable experience that confers understanding more about yourself than anything else.

**Q: How do I decide whether to go abroad?**

A: Going abroad and undergraduate research are not mutually exclusive.

While they share separate support services and offices, they actually enhance each other.

Going abroad may not necessarily involve literally working in an international lab. Rather, you may develop skills in a foreign country that may enhance your undergraduate experience.

**Q: Are there any university-wide requirements for doing research as an undergraduate?**

A: Yes.

All researchers, from students to faculty, must receive safety training, and those who work with animals or humans as subjects must undergo training as well. It is important, once you’ve begun working with your faculty advisor, that he/she makes these trainings available to you. In some sessions, you may learn about standard practices and safety measures. In others, you may be issued protective devices (i.e. a radiation safety badge) and informed on what your responsibilities include.

**Q: What if I no longer enjoy doing my research?**

A: Students leave their research for a variety of reasons, such as change in research interests, not enough time in their schedule, or if the dynamics between their advisor or lab group just isn’t right.

Be truthful with yourself: you should be enjoying your research experience. If you feel you can no longer commit to your research for whatever reason, it is okay to either stop or switch to something else.

There are several resources you could contact to discuss your situation, such as your academic advisor or research advisor from your college. They are there to help you make the transition.

Who Should I Interview With?

You should interview with professors who are conducting research in an area that interests you, and with whom you would potentially like to work. There is an abundant variety and quantity of research being conducted at Cornell. To find a professor whose work interests you, try the following:

Read course descriptions and find subject matter that catches your interest. Note who teaches the course(s). You can find course descriptions through the printed publication Courses of Study or through the Cornell webpage at:  
http://cuinfo.cornell.edu/Academic/Courses/

Check out the following research-related websites:

Research @ Cornell  
www.cornell.edu/research

Undergraduate Research  
www.research.cornell.edu/undergrad

How Do I Contact Professors?

The most efficient way to contact a professor is via email. Make sure you identify yourself, and that you would like to meet with them to learn more about their research.

If the professor does not write you back within a few days, try sending a follow-up message. They may just have missed it. You might also pay a visit to their department office. Check with the departmental administrative assistant as to when the professor’s office hours are. Make sure your professor is not out of town or on sabbatical.

Leave a professional and courteous message on their phone, indicating that you recently sent them an email and that you are interested in meeting with them to learn more about their research.

Pay a visit to the professor during his or her office hours to ask them a few questions about their research in order to ascertain whether you are interested in it. Remember to prepare some questions ahead of time and review information pertinent information about their research beforehand. In many cases it is not important to know every detail about their research because undertaking research is a learning process in of itself.
Narrowing your Interests

Check the website for your major’s department and for others that interest you. Many of these sites list faculty research interests, current research projects, and recent publications.

Read journal articles written by professors whose research appeals to you. This can both help determine which professors you want to meet with and prepare you for your meeting.

Talk to your faculty advisor. He or she should be an especially good source of information regarding the research that is being conducted in your department, and perhaps, in other departments and units as well.

If any of your current professors or classes interest you, talk to your professor after class or during office hours to ask what research he or she conducts.

Attend lectures, symposia, and seminars that focus on research projects that interest you.

Read about research at Cornell in the Cornell Chronicle (published on Thursdays). Search to see if a particular topic has been reported using the Chronicle’s web-based archive at:

http://www.news.cornell.edu/Utilities/U_search2.shtml

Ask your peer advisor for suggestions.

Talk with friends and classmates about projects that they are involved in.
For students fortunate enough to have been involved with research by their Junior year, an Honors research thesis is an excellent to cap their undergraduate years at Cornell. Numerous departments offer the option of pursuing an Honors research thesis, and these projects are not strictly limited to science fields. Students in ILR, History, and government all have the option of pursuing an Honors research thesis granted that they have the necessary requirements and grades. Students who successfully complete an Honors research thesis may get special recognition at graduation.

Although there are a myriad of requirements for doing an Honors research thesis, the following general guidelines are observed:

- The student must meet a certain GPA minimum in relevant classes (e.g. 3.0 or above for Biology majors), or in some cases be at a particular class rank (e.g. top twenty percent in ILR).
- The student should have a faculty member to supervise their research.
- The student should be in the major or field of study for which they intend to do their honors research.
- The student must be willing to invest the time and energy necessary to write a Honors Research Thesis and meet with their research supervisor.

Students usually must send their proposals for their Honors project a full year before they graduate (September for Spring graduates). Honor students are highly encouraged to present their research at CURB’s annual Spring Research Forum held in mid-April.
Research Scholarships

There are many awards for Cornell students undertaking research and even some scholarships specifically directed towards funding student research such as the Hunter Rawlings III Presidential Research Scholarship listed below. The number of scholarships available to exceptional students is too great to list here, but Cornell students in the past have been recipients of Goldwater Scholarship, Rhodes Scholarships, Marshall Scholarships, Churchill Scholarships and the Hertz Fellowships, often in association with conducting research. In addition many scholarships and research programs are especially looking for qualified underserved minority students.

HUNTER R. RAWLINGS III CORNELL PRESIDENTIAL RESEARCH SCHOLARS

Open to all students, across all academic disciplines, in all seven undergraduate colleges, Rawlings CPRS enables its students to collaborate with faculty mentors of their choosing in designing and planning an individualized program of research -- a degree of collaboration usually unheard of in the undergraduate experience. Magnifying the power of this dynamic student-faculty partnership, Rawlings CPRS provides each scholar with a generous $8,000 research support account (RSA) and an annual need-based loan replacement of up to $4,000.

Find out more at:
http://www.commitment.cornell.edu/
The Hughes Scholars Program is open to Cornell Biology majors interested in going on to graduate school, and each student accepted into the program is given a stipend over the summer. Students spend nine weeks engaged in full-time research at Cornell (June to August). Program is open to Sophomores and Juniors, with preference for Sophomores. Find out more at: http://hhmi.bio.cornell.edu/hschol/

Cornell University and the University of New Hampshire is involved with the Shoals Marine Laboratory on Appledore Island, Isles of Shoals, Maine. Undergraduates may earn a full semester’s college credit (up to 16 credit hours) in three summer months conducting marine biology research. Find out more at: http://www.sml.cornell.edu/

Many Cornell Undergraduate residents living in New York City who plan on taking a career in medicine opt to spend their summers conducting research at the Weill Cornell Medical College, either on their own accord or via special programs. One such program open to up to 75 premeds from various colleges is the Travelers Summer Research Fellowship Program: http://www.med.cornell.edu/education/programs/tra_sum_res.html
Another program in association with Sloan Kettering focusing on under-served college students is the Access Summer Research Program: http://biomedsci.cornell.edu/graduate_school/html/15041.cfm
The Tri-institutional Joint MD-Phd program is available at Weill Cornell Medical College, The Rockefeller University or Memorial Sloan-Kettering Cancer Center http://www.med.cornell.edu/mdphd/summerprogram/

These are only a few selected summer research programs open to undergraduates. There are many more programs attached to many other departments!
Research Experience for Undergraduates (REU), also known as Summer Undergraduate Research Experiences (SURE), are summer research programs funded by the National Science Foundation (NSF). REUs are hosted by different departments in over 200 universities across the country and are designed to encourage undergraduates to attend graduate school. When applying to REU programs it is important to indicate you would eventually like to apply for graduate school.

All REUs through the NSF are paid, and most of them include housing and meal plans. REUs are a great way to find your niche in research. Most REU programs are looking for sophomores and juniors, but freshmen and seniors are also able to be admitted to REU programs. You need to apply directly to the departments of the schools that you are interested in.

The NSF REU Website: 
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&from=fund

The NSF Directory of REU Programs: 
http://www.nsf.gov/crssprgm/reu/reu_search.cfm
There are a number of ways to find a research position at Cornell. Once you decide you want to do research, ask everyone you talk to if they know of any positions. Ask your faculty or student advisor, professors and graduate students that you meet in class, and staff members in your respective major.

The **faculty and administrators** listed on the next page are actively involved with helping undergraduates get involved with research at Cornell. You are encouraged to contact these people for answers to questions about undergraduate research in your respective college. You are also encouraged to visit the following website for general information on getting started with research: http://www.research.cornell.edu/Undergrad/. Finally, you are encouraged to get actively involved with CURB. CURB is a student organization that is devoted to fostering undergraduate research at Cornell. To find out more about CURB and/or to join CURB, visit their web site at [http://www.research.cornell.edu/CURB](http://www.research.cornell.edu/CURB), or send an email to curb@cornell.edu.

CURB has also compiled a list of **peer advisors**, students who are currently doing research at Cornell and would love to talk to you about any of your concerns regarding research. The list is broken down by college, and includes each student’s major, year, and a brief description of their research. To access the list, go to:

[http://www.research.cornell.edu/curb/find_peers.htm](http://www.research.cornell.edu/curb/find_peers.htm)
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Tracks left by NASA’s Opportunity Rover on the surface of Mars as it exited Victoria Crater.  
Image credit: NASA/JPL-Caltech
Adjunct Appointment: A term that may be applied only to assistant professors, associate professors, and professors. A person whose title is modified by the word ‘adjunct’ is one who, though his/her primary responsibility is outside the department, is willing to contribute part-time to the academic program.

Assistant Professor: Term given to tenure-track faculty before they achieve tenure. Assistant professors are expected to teach, do research, advise students, publish, obtain grants, and contribute to their department, college, and Cornell.

Associate Professor: Term given to faculty after they receive tenure.

Curriculum vitae (cv): Similar to a resume but includes every detail about the person’s experience. In the case of faculty this would include presentations, publications, courses taught, committees served on, etc. If you are asked for a cv, the person means a resume.

Endowed Colleges: The portion of Cornell that is funded through private funds, endowments, and/or donations. Arts and Sciences, Hotel Administration, Engineering, and Architecture, Art, and Planning are the endowed colleges at Cornell.

Endowed Professorships: Some faculty receive whole or partial funding from an endowment (money given to the university, the dividends from which are used to pay a variety of things, such as endowed professorships). When a faculty receives this, it means that their title is usually changed to include the name of the funder – such as Johannes and Hillary S. Knight Professor of Literature. This title is more formal and not typically used in regular correspondence.

Faculty Advisor or Academic Advisor: This is the faculty member who is assigned to you by your college and who will approve your courses. This person is also a great resource in terms of picking courses, offering ideas about research, and Cornell in general. You will, hopefully, get to know this person quite well over the next four years.

Graduate Student: Usually a student in a doctoral program although it might be a student in a master’s program. In most disciplines, graduate students are compensated for serving as teaching and/or research assistants. This means that their tuition is paid and they receive a stipend.

Grants: The money that faculty obtains from sources, other than Cornell, to conduct research or support programs and may sometimes support a portion of the faculty’s salary. Grants are applied for competitively and last for a certain period of time, hence the need to be reapplied for. They also can be taken away. This kind of money is sometimes referred to as soft money. These are very important and the writing of grant proposals takes a great deal of time.

Instructor: Non-tenure track persons who teach and do research.

Lecturer or Senior Lecturer: Primarily teaching, not research positions.

Post-doctoral Associate or Fellow: Individuals on the research staff whose primary goals are to extend their own educational experience. While they hold a doctoral degree, they work primarily under the direction of a faculty member.