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Your Personal Guide to Getting into Research

Katherine Vo. Brown

University of Louisville, katherine.brown@louisville.edu

Priyadarshini Chandrashekhar

University of Louisville, priyadarshini.chandrashekhar@louisville.edu

Harshith Gontla

University of Louisville, harshith.gontla@louisville.edu

Ekaterina S Kovatsenko

University of Louisville, ekaterina.kovatsenko@louisville.edu

Aamira Shah

University of Louisville, aamira.shah@louisville.edu

See next page for additional authors

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Authors

Katherine Vo. Brown, Priyadarshini Chandrashekhar, Harshith Gontla, Ekaterina S Kovatsenko, Aamira Shah, and Kelsey Littrell

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Katherine Brown¹, Priyadarshini Chandrashekhar¹, Harshith Gontla¹, Katya Kovatsenko¹, Aamira Shah¹, Kelsey Littrell¹

¹ The University of Louisville, Louisville, KY, USA

The stereotype of a researcher conjures up an image of a person in a white lab coat, juggling various test tubes and chemicals. However, this picture does not capture the essence of all research. Contrary to popular belief, you do not have to be a STEM major to do research! Research is for everyone, and there are many options to participate across all disciplines. As a Carnegie R1 research institute, the University of Louisville (UofL) is involved with groundbreaking research across many disciplines including education, political science, and business. Below are some compelling reasons to pursue research as an undergraduate student, and as you read further, you will hear first-hand advice from Dr. Running and Dr. Fuselier, two research professors in the Biology department at UofL.

THE FIVE GOLDEN REASONS

1. Explore and Identify Your Interests

Research enables you to delve deeper into subjects than would otherwise be possible in classroom settings. With so many different fields and subsets of research, the options are endless when determining what you might be most interested in. By narrowing down your passions, the research experiences gained can help you decide what specific career pathway is best for you. Simply by taking on different projects, you can learn what type of work you most enjoy.

For example, in Dr. Fuselier's experience she had

"[...an] undergraduate student... who...[was] pre-med and ... interested in [her] education research. [Dr. Fuselier] had the chance to hire her and... [she learned] some data science [...and] machine learning...She had never used anything like this before."

As Fuselier describes her student's experience in the lab, she spoke fondly of how her student gained unique experiences and skills outside the main

research topics. There are many interconnected fields in each research project, and there is no telling what valuable skills may be gained each time.

2. Contribute New Knowledge/Discoveries to the World

If you recall your elementary school science lessons, you may have learned that atoms make up all matter or that DNA is the blueprint of living things. But how do we know this information? We tend to take our knowledge for granted, but there was a time when none of this information was known. Everything we now know and will learn is because researchers discovered that information through rigorous experiments.

As an undergraduate researcher, you will be contributing to your field of interest by working to solve unanswered questions and making new discoveries. Research provides you with a more hands-on experience in whichever discipline you choose, as opposed to passively learning information from textbooks.

3. Develop as a Thinker

Early exposure to research can cultivate invaluable skills including the essential abilities to think critically and solve problems. After all, the fundamental process behind research consists of asking questions and searching for answers. No matter what

path you pursue in the future—whether it is specifically in research or not—life will present many challenges that don't have explicit answers. The analytical and reasoning skills you develop as a young researcher will ultimately help you in these situations in your future career.

4. Network and Present your Research at Conferences

Once you are heavily involved in research, you may consider attending a research conference specific to your field. Applying to these conferences is a great way to potentially show off the hours dedicated to your research. You can share your research with the scientific community, connect with other research-oriented undergraduate students, network, and learn about career paths in research. In particular, the University of Louisville hosts showcases, symposia, and other opportunities to present research throughout the year for any undergraduates looking to communicate their research and/or creative activity. Beyond UofL, other institutions will host international research conferences open to all undergraduate researchers. Participation in these universities' research conferences includes spending 2-4 days at the respective campuses during the time of the conference. Interested students can find deadlines to apply, dates of the conferences, potential financial aid for

attending, and other information by searching: “_____ University Research Conference.” Students should also keep an eye on their emails from their university for research opportunities such as these.

5. Increase Your Knowledge Base for Graduate Program Applications

“[Research] always looks great on a resume, no matter what you get into: graduate schools require it, and top professional schools, such as... med[ical] schools, require it, and it’s a huge plus for all other professional schools. UofL med[ical] school very strongly recommends it, for instance.”

As illustrated by Dr. Running’s advice, the skills, experience and credentials that research provides can boost your application/resume and your success in these programs. Participating in research conferences, presenting posters, and authoring publications as an undergraduate are incredible accomplishments that will serve you well in your academic career.

Research can also open other doors, such as competitive conferences, fellowships, and scholarships, that can help you meet your future goals. To help you in this process, the professors and graduate students that you work for can teach you valuable lessons and help you build connections within your field. Additionally, when applying to different programs, you can ask these people to write letters of recommendation and share connections within your field of interest. Ultimately, working in research can help you get your foot in the door when applying to graduate programs.

FINDING A RESEARCH LAB

With all these benefits mentioned above, you may have some questions about getting into research. The process of joining a lab can be initially confusing, especially for students who have not previously conducted research. However, you may be pleased to find that professors are often quite friendly when it comes to the process. In the case of Dr. Fuselier, joining her laboratory is a simple process. “...a first-year student comes to me and they don’t have any experience, that’s OK. I wouldn’t really necessarily expect them to.” In general, professors tend to expect students applying for entry lab positions to have little experience. While the process is slightly different from person to person with varying difficulty, there are some common steps you can follow to get started in research.

Oftentimes, finding a research lab with availability for an undergraduate is a difficult task. However, you can try a couple of ways to discover if there are any labs with openings at your University. The first is to look at Department pages on the University website. For example, students interested in psychology research might visit the webpage for the Department of Psychological and Brain Sciences. On some web pages, you can find a section devoted to undergraduate research with a list of current research assistant (RA) openings. Here, you can find information including prerequisites for joining the lab, descriptions of the lab’s area of research and what tasks an RA might be expected to do. Usually, professors will include a link to an online application for joining the lab on their department or personal website. Additionally, if your university has multiple facilities located off the main campus, you can often find a research lab there. For example, according to Dr. Running, at UofL, “it’s worth looking at opportunities at the HSC, including

School of Medicine and School of Dentistry research labs...”

Some research labs will not have a significant online presence, and, thus, these RA openings are not likely posted on any website. Here, cold-emailing professors to ask about RA positions might reveal opportunities for you that would not otherwise be obvious by just visiting the department page. Research positions are also sometimes advertised through University-wide emails; taking the time to read through them may help you find a lab position.

Additionally, striking up a conversation and getting to know a professor you have a class with might increase your chances of joining their lab. As Fuselier recalls, “a student in my biology class emailed me and... expressed interest in research. I connected them with somebody that matched their interests and I think...any professor would do that [for their students].” Once put in touch, the given professor might ask you to fill out an online application, do an interview, or both. Having a strong resume, interpersonal skills, and a passion for research will improve your chances of being selected.

Different opportunities might also be available depending on the time of year you apply. For RA positions during the school year, you may want to look for labs before the fall semester starts because many labs require a 2-semester minimum commitment. Additionally, if you encounter research programs that run during the summer only, you may have to apply a semester in advance. However, not all research opportunities are time dependent. Some laboratories have very flexible hours and are excellent with students with irregular schedules. From Dr. Running’s experience, he has found that:

”Some labs need more people over the summer, when fieldwork is more likely to occur, [such as when] growing season happens for plant labs... [Additionally,] many undergraduates who had worked during the school year [may have] graduated, gone home, or ... [gone to] work at an outside job. But all labs work all year, so, again, if a student has the time and the interest, they should seek opportunities regardless of what time of the year it is.”

It is important to note that these are general tips on how to join a lab; in reality, there are dozens of more niche ways to get involved in a research lab. Ultimately, the more places you look, the more opportunities you find. All the time and effort spent finding the right lab will be well worth the meaningful and impactful learning experience that comes with conducting research. Working with professors, laboratory technicians and graduate students, you will get a glimpse into how researchers understand complex issues, solve problems, and, in the end, innovate solutions.