

## Undergraduate research in the Ghaemmaghami Lab

Undergraduates can conduct research in our lab as volunteers, by participating in independent study courses or as part of paid summer internships. In a typical timeline, an undergraduate will join the lab as a volunteer during their first or second academic year, then continue in the lab as a full-time paid summer intern, then sign up for one or more independent study courses in their subsequent academic years. However, this timeline can vary between students and they are under no obligation to continue working in the lab for multiple semesters. Students can also apply for competitive national and international fellowships that allow them to conduct research in an external institution (often in the summer of their junior year).

Undergraduates are considered full members of the lab and are expected to follow all the pertinent lab policies. They are expected to present their research at university undergraduate symposia such as the [Undergraduate Research Expo](#) at the end of the spring semester or the UPBM symposium during Meliora weekend.

Below are some more specific guidelines:

1. *Getting started.* When undergraduates initially join our lab, they will typically be paired with a graduate student. By shadowing their graduate student mentor, undergraduates will familiarize themselves with our lab and become trained in relevant research techniques. As they become more experienced, undergraduates can take on more independent projects. When they first start in the lab, undergraduates must take the required biosafety classes, go through the lab walkthrough, and complete all tasks outlined in the Getting Started Checklist.

2. *Volunteer positions.* If an undergraduate is joining our lab during the academic year as a first research experience, they will typically work as a volunteer intern. These positions have flexible time commitments and can be planned around a student's course schedule. An important aspect of these initial positions is to determine whether the student is interested in continuing in our lab in subsequent semesters. To make this determination, it is important for the student to be engaged in the lab and attend lab events and meetings if possible.

3. *Summer fellowships.* Undergraduate research positions over the summer are typically paid positions. Students typically get paid a stipend (currently around \$5,000) to cover their living expenses. These stipends can be provided by summer fellowships such as the [Schwartz Discover Grant](#), [de Kiewiet fellowship](#), the [Summer Scholars Program](#), [MSTP Summer Scholars Program](#) and [Beckman Scholars Program](#). Additional opportunities may be available from the [Office of Undergraduate Research](#). Applications for these fellowships are typically due early during the spring semester. Putting together a successful application for these competitive fellowships is time consuming and requires input and recommendation letters from the PI and other professors. Students should therefore start the application process early and give themselves plenty of time to put together a compelling application. If a student puts in a good faith effort to submit a strong application but is not successful in obtaining a fellowship, our lab will typically be able to provide a summer stipend.

4. *Research Experience for Undergraduates (REUs).* Undergraduates from external institutions can join our lab during the summer as part of different REU programs, such

as the [Chemistry Research for Medicine and Energy REU Program](#). Different REUs have different programmatic requirements that students are responsible for fulfilling. Additionally, students must present their research to our group in a lab meeting at the end of the summer.

*5. Independent study.* Undergraduates with some research experience in our lab can enroll in independent research courses (BIOL/NSCI/CHEM/IND/BCH/ 395/395W). With these courses, students can conduct research for credit (up to 4 credit hours) during the academic year. The registration details and requirements of these courses are described [here](#).

*6. National and international fellowships.* Undergraduate students with some research experience should strongly consider applying for competitive national and international fellowships that provide research opportunities at UR and external institutions. Fellowships that undergrads from our lab have previously received have included the Astronaut Fellowship, Goldwater Fellowship, Fulbright Scholarship and DAAD RISE scholarship. Interested undergrads should schedule a meeting with the [Fellowships Office](#) to discuss the programs they may be qualified for.

*7. Senior thesis.* Seniors who have conducted research for more than two semesters in the lab and have accumulated a substantial body of work are strongly encouraged to write a senior thesis and obtain a “Honors in Research” designation from the department. Details of this process are described [here](#). Students interested in attaining this designation should discuss their intent with the PI early in the spring semester of their senior year.