



IMMUNOL 493 and 494: Independent Studies Undergraduate Course

Part of the mission of the Department of Integrative Immunobiology is to provide Duke Undergraduate students with research experiences. Students can gain hands-on experience in how experiments are conducted and will learn about cutting edge scientific methodologies and concepts. These experiences should give students an appreciation for the process of basic research, and encourage students to think analytically, and may also spark an interest in research as a career.

Laboratory research requires a significant time investment

We expect students to invest time equivalent to a laboratory course, at least 8-10 hours per week for 14 weeks. This time includes learning from mentors in the lab, reading published literature, planning experiments, performing experiments, analyzing data, recording results in a lab notebook, and planning a presentation for the end of the research class.

Project should be an independent research project

Although most projects are conducted under the close supervision of a mentor, the student should take substantial responsibility and ownership of the project. Students are expected to design and perform experiments, collect and analyze data, and then to interpret the data. Students are encouraged to generate new hypotheses (if appropriate) based on the results and to design the next experimental steps. Many students will be under the direct mentorship of another member of the lab. In such cases of a collaborative effort, undergraduate students should have a distinct and identifiable role in the project. Students should not simply provide low-level technical support for other projects, or simply be observing the work of others.

Final presentation

The University specifies that all independent studies must result in an academic product. Students in conversation with their lab advisor can choose any one of the following options. Each should cover the background, hypothesis, experimental approach, results, interpretation, and future directions for their project.

- Give a presentation at the lab meeting attended by their advisor and members of their lab.
- Give a poster presentation that is attended by their advisor and members of their lab.
- or -
- Write a paper to be submitted to their advisor. The advisor can assign the length of the paper, which could be a minimum of 4-5 pages of single-spaced text with additional pages for figures (which can be interwoven with the text). This option can also be submitted as an honors thesis to their home department.

Honors Thesis for graduation with Distinction

Undergraduate major departments typically have specific guidelines for students to write an honors thesis and then to graduate with distinction. Students who engage deeply in research in a lab in the Department of Integrative Immunobiology are encouraged to use this experience to write an honors thesis through their undergraduate home department (e.g. Department of Biology).

Course details

IMMUNOL 493 is for the fall, and **IMMUNOL 494** is for the spring semester. Students may enroll in these courses up to 9 times. Grades will be assigned by the laboratory advisor at the end of the semester.

Research advisors

Please review your student's final presentation/poster/report, and grade the student both upon this work as well as their overall engagement in the research and their participation in terms of time devoted to their independent study. Grades are submitted to [DukeHub](https://dukehub.duke.edu) (dukehub.duke.edu). Please submit the grade along with a brief written explanation for that grade to [Houda Williamson](mailto:immunologydept@mc.duke.edu) (immunologydept@mc.duke.edu).