

BIOL UN3500 - Independent Biological Research

FOR FURTHER INFORMATION ABOUT
THIS COURSE, CONTACT:

Fall 2023:
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Introduction to the course

BIOL UN3500 -Independent study is an opportunity for full-time undergraduates in the College, SEAS and GS interested in laboratory research to share in the work of an ongoing research program in our department or in a comparable laboratory elsewhere in the region. Projects should address a specific biological problem. Clinical projects are not allowed. While most projects are laboratory-based, computational projects that address specific biological issues are allowed. Projects are approved at the beginning of the course after review of registration materials, but Prof. Yuste (Fall) or Prof. Gaublomme (Spring) can be consulted beforehand.

The grade for the work in the course is determined by Prof. Yuste (Fall)/ Prof. Gaublomme (Spring) with input from the research advisor. The grade is based on regular attendance in the laboratory and recitations, a demonstrable understanding of the underlying question being asked by the research, and a clear report on the work accomplished. Further details are below.

Recitations:

There will be a weekly recitation for student presentation of research work. Students should attend a minimum of 5 recitations. Recitations will start in October 20th, 2023 for Fall 2023 and March 1st for Spring 2024. All students are required to register for UN3510 - 10:00-11:00am on Fridays, October 20th till December 8th for Fall 2023, March 1st till April 19th for Spring 2024. If there is an irreconcilable course conflict, consult with Prof. Yuste/Gaublomme and alternative assignments will be found.

A. Finding a Research Sponsor

The first step towards doing independent study research is finding a sponsor who will supervise your work. You must take the initiative to find a sponsor by contacting faculty who do research you are interested in. Any faculty member doing laboratory-based research in biological and biomedical sciences is an eligible sponsor; however mentors that are not on the [approved list](#) require departmental approval before registration is considered final. There are many excellent mentors not on the list; we would just like to make sure that the projects are appropriate for this course. Most sponsors are at Columbia's Morningside Heights or Health Sciences Campuses, however, sponsors in the New York area outside Columbia are also allowed. Some research projects are not allowed if they are not sufficiently related to the type of laboratory-based biological science performed in the department. Examples of disallowed work are clinical studies, reading of patient data and surveys of human behavior. Therefore, if there is any question, it is good to get approval from Prof. Yuste/Gaublomme as early as possible. Note that sponsors approved for SURF are not all eligible for UN3500 as SURF is a broader program.

You can find a spot in a lab as late as the first week of the semester, but you'll have the best chance at getting into a lab of your choice if you start

looking during the previous semester. Some further suggestions are given on the page "[How you can do biological research.](#)"

B. How to Register (4 steps)

You must complete the following steps to register for UN3500. Note that you have to register with the Registrar, as for any other class, AND you have to register with the Department, which requires completion of ALL THREE STUDENT'S TASKS, listed below, in a timely manner.

1. University registration. [Register for UN3500 with the Registrar.](#)
Students register for 2 to 4 credits. A general rule is a minimum of 4 hours lab time/week/credit, i.e. register for 3 credits for 12 hours of lab time/week and 4 credits for 16 or more. Note that 2 credits may not be sufficient to fulfill a major requirement; check for your specific major.
2. Departmental registration. Fill out the [on-line registration form](#). Due Date: As early as possible during the registration period, but definitely no later than the deadline. (Tuesday, Sept. 12 for Fall 2023; Tuesday, Jan. 23rd for Spring 2024). No late registration will be accepted.
3. Sponsor's Approval Letter. Make sure your sponsor has sent an approval letter (see below) by the deadline for departmental registration (Tuesday, Sept. 12 for Fall 2023; Tuesday, Jan. 23rd for Spring 2024).
4. One page proposal. Due Monday, Sept. 11 for Fall 2023, Monday Jan. 22nd for Spring 2024 for sponsors not on the approved list, due Friday, Sept. 15, Friday Jan. 26st for Spring 2024 for sponsors on the approved list. Please email your proposal to Prof. Yuste for Fall 2023 or Prof. Gaublomme for Spring 2024 and write your last name in the name of the file. See below.

C. Sponsor's Approval Letter

Ask your sponsor to write a letter by email, 1) confirming that s/he will supervise your work in their lab, 2) describing in a brief paragraph the work you will be doing, and 3) that they understand that they are taking on the responsibility of mentoring you and that they will provide a grade for your final paper during finals period. This letter should be sent to Prof. Yuste at rmy5@columbia.edu for Fall 2023 or Prof. Gaublomme at jg4106@columbia.edu for Spring 2024. The deadline is the same as for on-line registration (see dates above). Note that the sponsor must be a

faculty member, not a postdoctoral fellow or research associate, though a lab member may be designated for day-to-day supervision during the semester.

D. One Page Proposal. [L] [SEP]

After consulting with your sponsor about the project that you will work on, you should write a one-page proposal in clear prose describing the planned work, and submit the proposal by emailing Prof. Yuste at rmy5@columbia.edu for Fall 2023 or Prof. Gaublomme at jg4106@columbia.edu for Spring 2024. Do not copy your sponsor's grant application or research papers; we want your own words.

1. If you chose a mentor on the approved list or if you have been approved for UN3500 in a previous semester, your proposal is due by Friday, September 15th, 2023 for Fall 2023 or Friday Jan. 26st, 2024 for Spring 2024. You should receive an email either approving your project, or requesting additional information, within a week to 10 days after submitting your proposal. No late proposals will be accepted.
2. If you chose a mentor who is NOT on the approved list, your proposal is due by noon on Monday, September 11th, 2023 for Fall 2023 or Monday Jan. 22nd, 2024 for Spring 2024. There will be no extensions or exceptions. You should receive an email either approving your project, or requesting additional information, early the next week. Your registration for the course is considered tentative until your project is approved. If your project is not approved, you may still work in the lab as a volunteer, but you will not receive course credit for your work. [L] [SEP]

E. Course Requirement: Progress Report or Oral Presentation

Note: Students who give Oral Presentations in recitation classes DO NOT need to do the progress report.

Seven weeks into the semester, you must turn in a one-page progress report, describing your work thus far. Most students will not have research results at this point, but the progress report must provide an indication that your project is proceeding in the context of your own understanding of the

underlying issues and hypotheses being tested. This report should be submitted online through Courseworks/Assignments by the following deadlines: October 16 for Fall 2023 or February 26st for Spring 2024. Please also email the report to Dr. Yuste for Fall 2023 or Dr. Gaublomme for spring 2024.

F. Final Paper.

Near the end of the term, you are required to write a paper -- in the style of a scientific research article -- at a level understandable to a scientist who is working in a different area of biology. Page limits (6 pages single spaced) and guidelines will be provided during the semester. Do not copy or paraphrase your mentor's grants or papers. Assistance with the writing of your first scientific paper can be found on the page [Writing a scientific research article](#). Students may in addition review Professor David Helfand's book "Habits," from their Core science course [Frontiers of Science](#) for guidance. The paper must be submitted online through Courseworks/Assignments by Dec. 15 for Fall 2023 or April 26th for Spring 2024. You should also submit a final copy to your lab head. Please also email the report to Dr. Yuste at rmy5@columbia.edu for Fall 2023 or Dr. Gaublomme for Spring 2024. You should plan to write a first draft of the paper, submit it to your mentor for comments a week before the deadline, and then revise the paper accordingly, before the deadline. Students who register Pass/Fail are required to follow all the above steps, except that a one-page summary of research will be accepted in lieu of the research paper, for the grade of P, with the sponsor's agreement. Failure to submit that paper by the deadline will lead to the assignment of an F.

G. Sponsor's Grade

Your sponsor submits a grade for the semester, based on your laboratory work and your research paper.

After reading your paper, your sponsor should submit a grade to Prof. Yuste for Fall 2023 or Prof. Gaublomme for Spring 2024. The deadline for receiving this grade is Dec. 22, 2023 for Fall 2023 or May 3rd, 2024 for Spring 2024.

Grading guidelines will be sent to the sponsors.

H. Board of Undergraduate Research Advisors.

Each student will be assigned an advisor from our Board of Undergraduate Research Advisors comprised of faculty from across the university. The student must meet with this advisor at least once during the semester and this advisor will read and grade the final paper. The student is responsible for arranging these meetings.

I. Final Grade

Prof. Yuste or Gaublomme will assign your final grade, based on your progress report, the review of your paper by a member of the Board of Undergraduate Research Advisors, and your sponsor's recommendation. Important: you must have submitted all the information required ON TIME in order to receive a full grade.

J. Lab safety.

Research laboratories contain equipment and chemicals that can be dangerous if used improperly. If you are working with radiation or animals, you will be required to complete specific training by the university. You should take seriously the risks involved in laboratory research and make yourself aware of proper laboratory procedures. It's a good idea to read through one of the on-line manuals of laboratory safety that may be found on the [Laboratory Safety](#) page at the [SURF](#) site.

K. Academic Credit for UN3500 for Bio-related Majors

Check for updates for the specific majors. Biology majors may earn up to 2 semesters of lab credit toward the requirements for the biology major. UN3500 cannot be used to fulfill an elective requirement. Although additional semesters of UN3500 do not count towards the biology major, additional terms of UN3500 can be taken and count towards the 124 points needed for graduation.

L. Salaried Work is Not Allowed

Note that one cannot receive academic credit for salaried lab work, nor for unpaid work that was done before you registered for UN3500.