

## Undergraduate Research Guide for Biophysics Majors

### Research Requirements

The Biophysics major requires two semesters of independent laboratory work: Laboratory in Biophysics Research (250.531) and Research Problems in Biophysics (250.521 or 250.522 or 250.597 in the summer). Starting Fall 2010, research during intersession will no longer be accepted to meet the Biophysics major requirements.

### Research Philosophy

The JHU Biophysics research experiences are pursued in active research laboratories and constitute an apprenticeship in biophysical research. To initiate their research experience, students must search for and initiate a relationship with a “Research Supervisor” who is willing to work directly with the student.

In the initial phase, which may last for as long as a semester, the student may simply learn techniques, become familiar with the research problem and relevant literature and learn and understand the questions and goals of the overall research project. By the second semester the student is expected to become a semi-independent researcher able to perform experiments and expert enough to suggest improvements in procedures or revisions in the experimental design.

Repetitive tasks that require little or no initiative or intellectual input from the student, such as counting plates or bottle washing, do not, by themselves, constitute a suitable research apprenticeship. In successful research apprenticeships most students are able to obtain publishable data by the end of two semesters. Many students that pursue more than two semesters of research become co-authors of abstracts and papers published by their Research Supervisor.

### When to add research to your schedule

It is a good idea to start thinking about undergraduate research as a freshman or sophomore. Many students who enter JHU with AP credits even start their research projects early their sophomore year, but starting in your junior year is also fine.

### Biophysics research topics and locations

The Biophysics major allows undergraduate research experiences in a broad range of topics, however clinical research and survey-type investigations are not allowed. Students may arrange a research apprenticeship with any of the faculty at Homewood, the Schools of Medicine or Public Health as long as the work is related to biophysics. If the “Research Advisor” is not a member of the Jenkins Biophysics faculty, your Jenkins academic advisor will serve as a “Faculty Sponsor”. As you peruse topics, keep in mind that the research requirement is designed to get you involved in a research project that challenges the mind, brings professional skills, and offers you a way to come to know faculty and graduate students.

### Four steps to find a research position at JHU

*1. Find out what research is being carried out at JHU.*

Follow your natural interests in searching the JHU web pages of science faculty. The web pages for the [Jenkins Biophysics Department](#) and the [Graduate Program in Biophysics](#) are both good places to start.

As you read faculty research descriptions, you may come across a topic that caught your interest in a previous class or a technique that just sounds cool. Your faculty advisor can

help direct you to research labs that match your interests. Do not hesitate to ask them for advice.

Once you have identified two or three labs that interest you, download a paper or two from those labs and familiarize yourself with the scientific questions being addressed as well as the techniques that are employed.

### *2. Contact faculty members.*

Once you have found a research lab that interests you, send an email to the faculty member in charge, inquiring whether he or she has an opening. You will have the most success if you make faculty contacts the semester *prior* to when you want to start research. It is important in this first contact to introduce yourself to faculty members with a thoughtful paragraph: tell them about yourself (courses you have taken, any previous research experience, your long term goals), and state why you are interested in his or her lab. Be prepared to send a short resume, transcript, or recommendation from an instructor or TA. If the faculty member is interested, make an appointment to discuss potential research projects.

### *3. Register for research.*

Students may register for up to three credit hours of independent research each semester or during the summer; this is limited by JHU to a total of **six credit hours per academic year**. Biophysics majors should use one of the course numbers listed below.

To register, a yellow form for independent study should be signed by the Jenkins faculty sponsor and the Academic Advising office and returned to the Registrar along with any drop/add slips. If the “Research Supervisor” is a member of the Jenkins faculty, the Research Supervisor is also the “Faculty Sponsor”; if not, the Biophysics advisor can serve as the Faculty Sponsor.

Biophysics majors must complete at least one semester (3 credits) each of Laboratory in Biophysics (250.531) and Research Problems in Biophysics (250.521 or 250.522). For summer research, the registrar only allows 250.597, which can be used in lieu of Research Problems. Research during intersession does not count towards the major.

*Note that the six-credit limit per year of research is strictly enforced by the registrar's office, and additional credits per year are not allowed. The registrar's academic year starts with the summer semester. If you earn 3 research credits in the summer and 3 in the fall, you are not eligible to earn additional research credits in the spring.*

### *4. Write your research paper and receive credit and a grade.*

At the end of the semester, the student must write a two-page summary of the project and give it to the research supervisor and faculty sponsor. The Faculty Sponsor will submit the research grade online upon receipt of an email from the Research Supervisor indicating a grade and a satisfactory research paper. To avoid receiving an incomplete grade or other problems in grading, it is best to submit your paper before the end of finals. In particular, graduating seniors in their terminal semester should submit their papers on time and ensure they receive a grade before finals ends, or they risk losing their “graduating” status for that commencement period.