

## SIB Training Grant Course Requirements

To allow students coming from different backgrounds or enrolled in different degree programs to participate in the training program, we have redesigned our course requirements to be more flexible. We have replaced a set list of courses with a menu that will allow inclusion of students from any PhD program in the biomedical sciences while allowing them to meet their own program requirements. Students can petition for waivers in special cases. Students must take a course in each of the following four areas listed below. Other courses are taken as will benefit the student's interests and the requirements of their degree program. All students would additionally have to take PIBS 503 (Research Responsibilities and Ethics) and a student seminar.

### **Integrative Biology**

Physiology 510	Systems and Integrative Physiology
Or Neuroscience 602	Principles of Neuroscience (Integrative)
Or Physiology 555	Method and Logic in Biomedical Science

### **Cell and Molecular Function**

Physiology 576,577	Cell Physiology
Or CDB 530	Cell Biology
Or Neuroscience 601	Principles of Neuroscience (Cell and Molecular)
Or Biological Chemistry 550	Protein Structure and Function

### **Genetics and Molecular Biology**

Human Genetics 541	Molecular Genetics
Or MCDB 427	Molecular Biology

### **Quantitative and Computational Science**

Physiol/Bioinf 520	Computational Systems Biology in Physiology
Or Bioinformatics 527	Introduction to Bioinformatics and Computational Biology
Or Bioinformatics 524	Foundations for Bioinformatics

### **SIB Workshop (no academic credit)**

In lieu of a traditional journal club, the program includes an interactive workshop. Students, faculty and guests meet for two hours once a month during the Fall and Winter semesters. We currently meet on the third Wednesday 5:30-7:30 PM. Each year, we jointly pick a specific topic for study that includes relevant journal articles that are used as a springboard for replicating and expanding existing computational models. Recent topics were: 1) Dual oscillator models of insulin secretory patterns from pancreatic islets and 2) Reanalysis and development of novel statistical methods for a large data set with >40 dependent variables from a multicenter study of the effects of antibiotics on metabolism in different strains of mice combined with low or high fat diets. The students work between the monthly meetings in groups of 2-3, with advice from a faculty member, to prepare a presentation of a selected article or a computational model from their own lab and replicate the data using MatLab (or alternative coding languages such as R, Anaconda or Python) scripts. Proficiency in writing code with MatLab is not a prerequisite, but a commitment to learn and actively participate is expected. Students should plan to attend each of the eight monthly meetings. To provide year to year continuity, share their developing expertise and broaden the overall training experience in systems biology, we expect our trainees to participate in the workshop for one additional year beyond their funding from the grant.