CELL BIOLOGY (CLBY)

CLBY 416. Fundamental Immunology. 4 Units.
Introductory immunology providing an overview of the immune system, including activation, effector mechanisms, and regulation. Topics include antigen-antibody reactions, immunologically important cell surface receptors, cell-cell interactions, cell-mediated immunity, innate versus adaptive immunity, cytokines, and basic molecular biology and signal transduction in B and T lymphocytes, and immunopathology. Three weekly lectures emphasize experimental findings leading to the concepts of modern immunology. An additional recitation hour is required to integrate the core material with experimental data and known immune mediated diseases. Five mandatory 90 minute group problem sets per semester will be administered outside of lecture and recitation meeting times. Graduate students will be graded separately from undergraduates, and 22 percent of the grade will be based on a critical analysis of a recently published, landmark scientific article. Offered as BIOL 316, BIOL 416, CLBY 416, PATH 316 and PATH 416. Prereq: Graduate standing.

CLBY 435. Seminar in Molecular Biology/Microbiology. 1 Unit.
Graduate students will attend the departmental seminar given by all graduate students in the Department of Molecular Biology and Microbiology, in the Molecular Virology Program, and in the Cell Biology Program, as well as give a seminar on their own thesis research. Students will be evaluated by the faculty member in charge of that student's seminar with input from the students' own thesis committee. After each seminar, the student presenter will meet with other graduate students for peer-review of the content, delivery, and style of the seminar. Peer reviewers will also be evaluated for the quality of their input. Offered as CLBY 435 and MBIO 435 and MVIR 435.

CLBY 450. Cells and Pathogens. 3 Units.
Modern molecular cell biology owes a great debt to viral and bacterial pathogens as model systems. In some instances pathogens operate by faithful mimicry of host proteins, and other cases represent the result of extensive molecular tinkering and convergent evolution. This course will also explore numerous mechanisms utilized by pathogens to subvert the host and enhance their own survival. Topics covered include nuclear regulatory mechanisms, protein synthesis and stability, membrane-bound organelles, endocytosis and phagocytosis, and factors that influence cell behavior such as cytoskeleton rearrangements, cell-cell interactions, and cell migration. Additional topics include cell signaling and co-evolution of pathogens and host cell functions. Students are expected to come to class prepared to discuss pre-assigned readings consisting of brief reviews and seminal papers from the literature. Student assessment will be based on effective class participation (approximately 80%) and successful presentation of an independent research topic (approximately 20%). Offered as CLBY 450, MBIO 450, and MVIR 450. Prereq: CBIO 453 and CBIO 455 or permission of instructor.

CLBY 466. Cell Signaling. 3 Units.
This is an advanced problem set and research paper-based discussion format course that covers cell signaling mechanisms; there are no lectures. Included are discussions of neurotransmitter-gated ion channels, growth factor receptor kinases, cytokine receptors, G protein-coupled receptors, steroid receptors, heterotrimeric G proteins, ras family GTPases, second messenger cascades, protein kinase cascades, second messenger regulation of transcription factors, signals for regulation of cell growth, division, tissue development and cell death. Offered as CLBY 466, NEUR 466, PHOL 466 and PHRM 466.

CLBY 525. Neurodegenerative Diseases of the Brain and the Eye: Molecular Basis of the Brain-Eye Connection. 3 Units.
This is a graduate-level seminar course that familiarizes students with common neurodegenerative conditions of the brain and the eye. The molecular basis of each disorder and associated ophthalmic pathology will be emphasized. Contribution of heavy metals in brain and ocular pathology will be discussed where appropriate. Specific examples include Alzheimer's Disease, Parkinson's Disease, prion disorders, Huntington's Disease, age-related macular degeneration, glaucoma, and others based on popular demand. The students will be expected to discuss relevant research publications in class in an interactive format. Grading will be based on class participation and completion of an R21 grant proposal. Concurrent enrollment in PATH 526 on grant writing skills is strongly recommended but not required. Offered as PATH 525 and CLBY 525.

CLBY 526. Cell Biology and Human Disease. 3 Units.
This course is designed to provide broad base of knowledge regarding cell structure and function. The basic structure of the cell will be discussed, as will the various functional systems that are superimposed upon and interact with this structure. The course will discuss organelle biogenesis, materials movement inside cells, cell interaction with the external environment, cell cycle and cell death regulation, cytoskeleton dynamics, quality control mechanisms, and basic signal transduction concepts. The course will also discuss how abnormal cell function may lead to human disease, and how basic cell function may be harnessed by intracellular pathogens to provide favorable intracellular environments for replication. The major goals of this course are to provide students with a working knowledge of the cell to facilitate understanding of the scientific literature, and to familiarize students with modern experimental approaches in cell biology. The course will rely heavily on student participation. Students will be provided with study guides with the expectation they will come to class prepared to lead interactive group discussions with minimal input from instructors. Offered as CLBY 526, MBIO 526 and MVIR 526.

CLBY 601. Special Problems. 1 - 18 Units.
This is the listing for independent research. Students should enroll in this course once they have selected their laboratory for Ph.D. research. The number of credit hours depends on how many didactic courses they are following at the same time. Once they have passed their qualifying examination they should register for CLBY 701.

CLBY 701. Dissertation Ph.D.. 1 - 9 Units.
This is the listing for independent research toward the Ph.D. The number of credit hours depends on how many didactic courses students are following at the same time. Students may register for this course only once they have passed their qualifying examination. Prereq: Predoctoral research consent or advanced to Ph.D. candidacy milestone.