

# Molecular and Cell Biology

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## Overview

The teaching and research activities of the Department of Molecular and Cell Biology (MCB) concern the molecular structures and processes of cellular life and their roles in the function, reproduction, and development of living organisms.

This agenda covers a broad range of specialized disciplines, including biochemistry, biophysics, molecular biology, structural biology, genetics, genomics, bioinformatics, cell biology, developmental biology, tumor biology, microbiology, immunology, pathogenesis and neurobiology.

The types of living organisms from which the departmental faculty draws its working materials are as diverse as its disciplinary specializations — ranging from viruses and microbes through plants, roundworms, annelids, arthropods, and mollusks, to fish, amphibia, and mammals.

The faculty of the department is organized into five divisions: Biochemistry and Molecular Biology; Cell and Developmental Biology; Genetics, Genomics, and Development; Neurobiology; and Immunology and Pathogenesis.

## Research Facilities

**The Cancer Research Laboratory** is a research institute on the Berkeley campus that carries on a research, teaching, and service program designed to foster interdepartmental participation in cancer research. Some of the Department of Molecular and Cell Biology faculty are also members of the Cancer Research Laboratory. The central research program represents a multidisciplinary approach to an understanding of the mechanism of neoplastic transformation using a variety of systems. Graduate student and postdoctoral research programs are supported in various areas of tumor biology, biochemistry, cell biology, endocrinology, genetics, immunology, molecular biology, and tumor virology. The Cancer Research Laboratory also operates three research facilities:

1. Flow Cytometry Facility (<https://crl.berkeley.edu/flow-cytometry-facility/>)
2. Molecular Imaging Center (<https://crl.berkeley.edu/molecular-imaging-center/>)
3. Gene Targeting Facility (<https://crl.berkeley.edu/gene-targeting-facility/>)

Instrumentation in the facilities is operated by highly trained staff, and training is offered in methods and techniques associated with each facility. For more information, visit the CRL website. (<http://crl.berkeley.edu/?q=crl>)

**The Functional Genomics Laboratory at Berkeley** enables researchers to conduct state-of-the-art research in functional genomics, with a focus on using Next Generation sequencing technologies. These technologies include the sequencing of entire genomes of selected model systems and the ability to survey genome-wide patterns of gene expression and now allow the dissection of biological processes at unprecedented levels of detail. In particular, this research facility provides the infrastructure, technologies, and computational resources for the performance of DNA microarray experiments, which allow the analysis

of mRNA expression from tens of thousands of genes at a time. The Functional Genomics Laboratory currently possesses all the equipment necessary for conducting DNA microarray experiments, including thermal cyclers; fluidics robots; microarray printing robots; laser-scanning microscopes for microarray scanning; an Affymetrix workstation and scanner; and dedicated computers for data analysis and storage of informatics databases. For more information, go to this website (<http://qb3.berkeley.edu/fgl/>).

**The Robert D. Ogg Electron Microscope Laboratory** is an instructional and research unit of the College of Letters and Science. It houses equipment for transmission electron microscopy (TEM) and scanning electron microscopy (SEM). The staff is skilled not only in the operation and maintenance of instruments but also in standard and most specialized techniques of sample preparation. Qualified undergraduates and graduate students, postdoctoral associates, faculty, and research staff in biological and physical sciences, once trained, may make arrangements for use of the instruments in research. Instruction is provided both in classes and in individual training. Registered students and faculty are not charged for training. Nominal charges are made for use of the laboratory for individual research work. With permission from the director, non-UC personnel can be accepted for training or laboratory use. Equipment can be used outside normal hours. The laboratory provides demonstrations of the electron microscope and preparative techniques for on-campus classes and can make special arrangements for tour groups. For more information, go to this website (<http://em-lab.berkeley.edu/EML/>).

## Undergraduate Programs

Molecular and Cell Biology (<http://guide.berkeley.edu/archive/2020-21/undergraduate/degree-programs/molecular-cell-biology/>): BA

### Graduate Program

Molecular and Cell Biology (<http://guide.berkeley.edu/archive/2020-21/graduate/degree-programs/molecular-cell-biology/>): PhD

## Molecular and Cell Biology

Expand all course descriptions [+]  
Collapse all course descriptions [-]

## MCELLBI 15 Current Topics in the Biological Sciences 2 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Students in this course will critically examine modern methods of biological investigations and their social implications. Relevant literature will be used to present basic biological concepts that address the cultural, technological and health aspects of current topics in the biological sciences. Designing and evaluating scientific questions will be stressed. Current Topics in the Biological Sciences: Read More [+]

### Rules & Requirements

**Prerequisites:** Suitable for freshmen who plan to major in a biological science

**Repeat rules:** Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructor:** Matsui

Current Topics in the Biological Sciences: Read Less [-]

## MCELLBI C31 Big Ideas in Cell Biology 3 Units

Terms offered: Spring 2014, Spring 2012

An introduction for students who do not intend to major in biology but who wish to satisfy their breadth requirement in Biological Sciences. Some major concepts of modern biology, ranging from the role of DNA and the way cells communicate, to interactions of cells and creatures with their environment, will be discussed without jargon and with attention to their relevance in contemporary life and culture.

Big Ideas in Cell Biology: Read More [+]

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Wilt

**Also listed as:** L & S C30X

Big Ideas in Cell Biology: Read Less [-]

## MCELLBI 32 Introduction to Human Physiology 3 Units

Terms offered: Fall 2021, Summer 2021 8 Week Session, Fall 2020

A comprehensive introduction to human biology. The course will concentrate on basic mechanisms underlying human life processes, including cells and membranes; nerve and muscle function; cardiovascular, respiratory, renal, and gastrointestinal physiology; metabolism, endocrinology, and reproduction.

Introduction to Human Physiology: Read More [+]

### Rules & Requirements

**Prerequisites:** One year high school or college chemistry

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 8 weeks - 6 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Ball

Introduction to Human Physiology: Read Less [-]

## MCELLBI 32L Introduction to Human Physiology Laboratory 2 Units

Terms offered: Fall 2021, Summer 2021 Second 6 Week Session, Fall 2020

Experiments and demonstrations are designed to amplify and reinforce information presented in 32. Exercises include investigations into the structure and function of muscle, nerve, cardiovascular, renal, respiratory, endocrine, and blood systems.

Introduction to Human Physiology Laboratory: Read More [+]

### Rules & Requirements

**Prerequisites:** 32 or may be taken concurrently

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture and 3 hours of laboratory per week

### Summer:

6 weeks - 2 hours of lecture and 8 hours of laboratory per week  
8 weeks - 2 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructor:** Ball

Introduction to Human Physiology Laboratory: Read Less [-]

## MCELLBI 38 Stem Cell Biology, Ethics and Societal Impact 3 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019  
Innovations in bioengineering and use of stem cells will significantly impact our ability to combat human disease, genetic disorders and physiological dysfunction. An understanding of human stem cell biology will be critical to make informed decisions on our health and public policy. Stem Cell Biology, Ethics and Societal Impact: Read More [+]

### Rules & Requirements

**Repeat rules:** Course may be repeated for credit with instructor consent.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Firestone, Ball

Stem Cell Biology, Ethics and Societal Impact: Read Less [-]

## MCELLBI 41 Genetics and Society 3 Units

Terms offered: Spring 2016, Spring 2013, Summer 2012 8 Week Session  
Basic communication of inheritance; gene mapping; gene expression and genetic disease in animals and humans; social inheritance of genetics. Genetics and Society: Read More [+]

### Rules & Requirements

**Prerequisites:** Primarily for students not specializing in biology

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 41 after completing Biology 1A, Biology 1B, or Letters and Science 18.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Summer:

6 weeks - 7.5 hours of lecture per week

8 weeks - 6 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Genetics and Society: Read Less [-]

## MCELLBI C44 Biology for Voters 3 Units

Terms offered: Spring 2017, Spring 2015, Spring 2014

This is a Discovery Course for non-Biology majors designed to introduce lower-division college students to biology through the lens of the contemporary problems facing people, the planet and the species of the planet. Modern genetic contributions will be presented on such issues as genetic engineering of plants and animals, the emergence of new pathogens, the role of genetic variation among individuals, and the extent to which DNA is and isn't destiny. Each week will close with the presentation and discussion of a defining biological challenge facing the world.

Biology for Voters: Read More [+]

### Objectives & Outcomes

**Student Learning Outcomes:** The learning objectives will be, at one end, to understand what an experiment is, how is it controlled and what does one need to know about an experiment to be able to rely upon any conclusion. That is the fundamental issue in all science, and is frequently overlooked in many media accounts of science. A second objective is to learn enough of the language of biology to be able to ask the kind of informed questions that we would want all elected representatives to pay attention to. A third objective is for students to cultivate confidence that through non-specialized information sources they can become informed consumers of contemporary scientific thought, and to develop those habits of intellect to think about evidence in a scientific manner. A fourth objective is for students to enjoy the abundance of high quality books, articles and multimedia that will enable a lifetime of discovery outside the structure of a college course.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Rine, Urnov

**Also listed as:** L & S C30Y

Biology for Voters: Read Less [-]

## MCELLBI 50 The Immune System and Disease 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Course will discuss how the immune system resolves, prevents, or causes disease. A general overview of the immune system will be covered in the first five weeks followed by five weeks discussing infectious diseases including anthrax, mad cow, herpes, malaria, tuberculosis, and HIV. In addition, other lectures will focus on current immunology topics including vaccines, autoimmunity, allergy, transplantation, and cancer.

The Immune System and Disease: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** High school chemistry or Chemistry 1A and high school biology or Biology 1A. Biology 1AL is not required

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 50 after completing Molecular and Cell Biology 102, C100A/Chemistry C130, or Chemistry 135.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Beatty

The Immune System and Disease: [Read Less](#) [-]

## MCELLBI 55 Plagues and Pandemics 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Discussion of how infectious agents cause disease and impact society at large. We will examine historical and current examples of plagues and pandemics and consider the question of what we should do to ameliorate the impact of infectious disease in the future. The course is intended for non-majors and will begin by briefly providing necessary background in microbiology and immunology. The primary focus in each subsequent week, however, will be on discussing a particular infectious disease. The course will be broad in scope covering biological, historical, ethical and social implications of each disease.

Plagues and Pandemics: [Read More](#) [+]

### Rules & Requirements

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 55 after completing Molecular and Cell Biology 100, C100A/Chemistry C130,, 100B, 102, 103, C103/Plant and Microbial Biology C103/Public Health C102, 150, or Chemistry 135.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Beatty, Vance

Plagues and Pandemics: [Read Less](#) [-]

## MCELLBI C61 Brain, Mind, and Behavior 3 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Introduction to human brain mechanisms of sensation, movement, perception, thinking, learning, memory, and emotion in terms of anatomy, physiology, and chemistry of the nervous system in health and disease. Intended for students in the humanities and social sciences and others not majoring in the biological sciences.

Brain, Mind, and Behavior: Read More [a]

### Rules & Requirements

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology/Psychology C61 after taking Molecular and Cell Biology 61, N61, W61, Molecular and Cell Biology 104, C100A/Chemistry C130, Molecular and Cell Biology 110, 130A, 136, 160, C160/Neuroscience C160 or Integrative Biology 132. A deficient grade in Molecular and Cell Biology 61, N61, or W61 can be removed with Molecular and Cell Biology C61. Students cannot credit for both MCELLBI/PSYCH C61 AND Psych 110.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Presti

**Also listed as:** PSYCH C61

Brain, Mind, and Behavior: Read Less [-]

## MCELLBI W61 Brain, Mind, and Behavior 3 Units

Terms offered: Summer 2021 First 6 Week Session, Summer 2020 First 6 Week Session, Summer 2019 First 6 Week Session

This course deals with the structure and function of the human nervous system, with an emphasis on how brain physiology and chemistry are related to human behavior. This is a comprehensive introduction to the exciting field of contemporary neuroscience for students of all backgrounds and interests, including those from the humanities and social sciences, as well as physical and biological sciences. The Final Examination will be administered in a proctored setting. See Schedule of Classes for meeting information. This course is web-based.

Brain, Mind, and Behavior: Read More [a]

### Rules & Requirements

**Credit Restrictions:** Students will receive no credit for MCELLBI/PSYCH W61 after taking MCELLBI 61, N61, C61, MCELLBI 104, C100A/Chemistry C130, MCELLBI 110, 130A, 136, 160, C160/Neuroscience C160 or Integrative Biology 132. A deficient grade in MCELLBI 61, N61, OR C61 can be removed with W61. Students cannot credit for both MCELLBI/PSYCH C61 AND Psych 110.

### Hours & Format

**Summer:** 6 weeks - 7 hours of web-based lecture and 2.5 hours of web-based discussion per week

**Online:** This is an online course.

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Presti

Brain, Mind, and Behavior: Read Less [-]

## MCELLBI C62 Drugs and the Brain 3 Units

Terms offered: Fall 2020, Fall 2019, Fall 2018

The history, chemical nature, botanical origins, and effects on the human brain and behavior of drugs such as stimulants, depressants, psychedelics, analgesics, antidepressants, antipsychotics, steroids, and other psychoactive substances of both natural and synthetic origin. The necessary biological, chemical, and psychological background material for understanding the content of this course will be contained within the course itself.

Drugs and the Brain: [Read More](#) [+]

### Rules & Requirements

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology C62/Letters and Science C30T after completing Molecular and Cell Biology C100A/Chemistry C130, 104, 110, 130, 136, 160 Integrative Biology 132.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 8 weeks - 4.5 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructor:** Presti

**Also listed as:** L & S C30T

Drugs and the Brain: [Read Less](#) [-]

## MCELLBI 63 Introduction to Functional Neuroanatomy 3 Units

Terms offered: Summer 2021 Second 6 Week Session, Summer 2020 Second 6 Week Session, Summer 2019 Second 6 Week Session

This course emphasizes beginning anatomy of the brain and spinal cord to individuals interested in understanding the dynamics of motor and sensory functions in the human body. Students in the Departments of Education, Psychology, and Integrative Biology, as well as students interested in medicine and the life sciences, are especially encouraged to attend.

Introduction to Functional Neuroanatomy: [Read More](#) [+]

### Rules & Requirements

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 63 after completing Molecular and Cell Biology 104, C100A/Chemistry C130, Molecular and Cell Biology 110, 130A, 136, 160, 161, C160/Neuroscience C160 or Integrative Biology 132.

### Hours & Format

#### Summer:

4 weeks - 12 hours of lecture per week

6 weeks - 7.5 hours of lecture per week

8 weeks - 6 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Introduction to Functional Neuroanatomy: [Read Less](#) [-]

## MCELLBI 63L Introduction to Neuroanatomy Lab 2 Units

Terms offered: Summer 2019 Second 6 Week Session

This lab course is an introduction to mammalian neuroanatomy for non-MCB majors. We will do dissections, explore physical anatomical models, and observe microscopic structures within preserved brain slices from a variety of mammalian species. The hands-on exploration of anatomy is key to understanding how the different functional regions of the nervous system are interconnected. Besides gaining a better understanding of anatomy, you will gain important scientific skills such as conducting parts of a neurological exam, fluorescent and light microscopy, reading MRI scans and conducting fine dissections. The course will culminate with a group project using the online Allen Brain Atlas to investigate a novel scientific question.

Introduction to Neuroanatomy Lab: Read More [+]

### Rules & Requirements

**Prerequisites:** MCELLBI 63 (may be taken concurrently) or equivalent

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 63L after taking Molecular and Cell Biology 160L or 163L

### Hours & Format

**Summer:** 6 weeks - 8 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Ball

Introduction to Neuroanatomy Lab: Read Less [-]

## MCELLBI C64 Exploring the Brain: Introduction to Neuroscience 3 Units

Terms offered: Summer 2021 8 Week Session, Summer 2020 8 Week Session, Summer 2019 8 Week Session

This course will introduce lower division undergraduates to the fundamentals of neuroscience. The first part of the course covers basic membrane properties, synapses, action potentials, chemical and electrical synaptic interactions, receptor potentials, and receptor proteins. The second part of the course covers networks in invertebrates, memory and learning behavior, modulation, vertebrate brain and spinal cord, retina, visual cortex architecture, hierarchy, development, and higher cortical centers.

Exploring the Brain: Introduction to Neuroscience: Read More [+]

### Rules & Requirements

**Prerequisites:** High school chemistry or Chemistry 1A; high school biology or Biology 1A. Biology 1AL is not required

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology/Psychology C64 after taking Molecular and Cell Biology C61/ Letters and Science C30W, Molecular and Cell Biology C104, 100A/ Chemistry C130, Molecular and Cell Biology 110, 130A, 136, 160, C160/ Neuroscience C160, or Integrative Biology 132. Students may remove a deficient grade in Molecular and Cell Biology C64/Psychology C64 after Molecular and Cell Biology 64.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

**Summer:** 8 weeks - 4 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Caporale

**Also listed as:** PSYCH C64

Exploring the Brain: Introduction to Neuroscience: Read Less [-]



## MCELLBI C75 Introduction to the Biotechnology Field and Industry 2 Units

Terms offered: Spring 2019

This course offers an introduction to the field of biotechnology and will cover the history of the field, its impact on medicine and society, key methodologies, important therapeutic areas, and the range of career options available in the biopharmaceutical industry. In addition to lectures on innovation and entrepreneurship, students will hear from lecturers with expertise ranging from molecular biology to clinical trial design and interpretation. Several case studies of historically impactful scientists, entrepreneurs, and biotherapeutic companies will be presented. Students will work in teams to create and develop novel biotechnology company ideas to present in class. Intended for students interested in the Biology +Business program.

Introduction to the Biotechnology Field and Industry: [Read More](#) [+]

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Alternative to final exam.

**Instructors:** Kirn, Lasky

**Formerly known as:** Molecular and Cell Biology C95B/Undergrad. Business Administration C95B

**Also listed as:** UGBA C95B

Introduction to the Biotechnology Field and Industry: [Read Less](#) [-]

## MCELLBI 84B Sophomore Seminar 1 or 2 Units

Terms offered: Fall 2013, Spring 2013, Fall 2012

Sophomore seminars are small interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores.

Sophomore Seminar: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** At discretion of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-2 hours of seminar per week

### Summer:

6 weeks - 4-6 hours of seminar per week

8 weeks - 3-4 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Final exam required.

Sophomore Seminar: [Read Less](#) [-]



## MCELLBI 88 Immunotherapy of Cancer: Success and Failures 2 Units

Terms offered: Spring 2018, Spring 2017

We will work with a variety of datasets that describe a molecular view of cells and how they divide. We will learn about the processes that cause cells to become specialized (differentiate) and to give rise to cancer (transform). We will analyze data on genetic mutations in cancer that distinguish tumor cells from normal cells. We will learn how mutations are detected by the immune system and the basis of cancer immunotherapy. Finally we will analyze data on clinical trials of cancer immunotherapy to define the correlates of success in curing the disease. The students are expected to gain an understanding of data that reveals the basics of cell physiology and cancer, how immunotherapies of cancer work and their current limitations.

Immunotherapy of Cancer: Success and Failures: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Foundations of Data Science: COMPSI C8, DATASCI C8, INFO C8 or STAT C8

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture and 1 hour of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Shastri

Immunotherapy of Cancer: Success and Failures: Read Less [\[-\]](#)

## MCELLBI 90A Freshman Seminars: Biochemistry and Molecular Biology 1 Unit

Terms offered: Fall 2020, Fall 2019, Fall 2018

The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Final assessment to be decided by the instructor when the class is offered.

Freshman Seminars: Biochemistry and Molecular Biology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Open to freshmen only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Alternative to final exam.

Freshman Seminars: Biochemistry and Molecular Biology: Read Less [\[-\]](#)

## MCELLBI 90B Freshman Seminars: Cell and Developmental Biology 1 Unit

Terms offered: Fall 2021, Spring 2018, Fall 2017

The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Final assessment to be decided by the instructor when the class is offered.

Freshman Seminars: Cell and Developmental Biology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Open to freshmen only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Alternative to final exam.

Freshman Seminars: Cell and Developmental Biology: Read Less [\[-\]](#)

## MCELLBI 90C Freshman Seminars: Genetics and Development 1 Unit

Terms offered: Fall 2019, Fall 2018, Fall 2016

The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Final assessment to be decided by the instructor when the class is offered.

Freshman Seminars: Genetics and Development: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Open to freshmen only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Alternative to final exam.

Freshman Seminars: Genetics and Development: Read Less [\[-\]](#)

## MCELLBI 90D Freshman Seminars: Immunology 1 Unit

Terms offered: Fall 2021, Fall 2020, Fall 2019

The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Final assessment to be decided by the instructor when the class is offered.

Freshman Seminars: Immunology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Open to freshmen only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Alternative to final exam.

Freshman Seminars: Immunology: Read Less [\[-\]](#)

## MCELLBI 90E Freshman Seminars: Neurobiology 1 Unit

Terms offered: Fall 2021, Spring 2021, Fall 2020

The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester. Final assessment to be decided by the instructor when the class is offered.

Freshman Seminars: Neurobiology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Open to freshmen only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Alternative to final exam.

Freshman Seminars: Neurobiology: Read Less [\[-\]](#)

## MCELLBI C96 Studying the Biological Sciences 1 Unit

Terms offered: Fall 2021, Fall 2020, Fall 2019

Students will be introduced to the "culture" of the biological sciences, along with an in-depth orientation to the academic life and the culture of the university as they relate to majoring in biology. Students will learn concepts, skills, and information that they can use in their major courses, and as future science professionals.

Studying the Biological Sciences: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

**Instructor:** Matsui

**Also listed as:** INTEGBI C96/PLANTBI C96

Studying the Biological Sciences: Read Less [\[-\]](#)

## MCELLBI 98 Directed Group Study 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Lectures and small group discussions focusing on topics of interest, varying from semester to semester.

Directed Group Study: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Freshmen and sophomores only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of directed group study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Directed Group Study: Read Less [\[-\]](#)

## MCELLBI 99 Supervised Independent Study 1 - 4 Units

Terms offered: Spring 2012, Fall 2009, Spring 2009

Supervised Independent Study: Read More [ + ]

### Rules & Requirements

**Prerequisites:** 3.3 GPA and consent of instructor

**Credit Restrictions:** One unit of credit is given for every three hours of work in the lab per week to a maximum of 4 units.

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of independent study per week

### Summer:

8 weeks - 1.5-7.5 hours of independent study per week

10 weeks - 1.5-6 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Supervised Independent Study: Read Less [ - ]

## MCELLBI 100B Biochemistry: Pathways, Mechanisms, and Regulation 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course surveys cellular metabolism with a focus on the underlying bioenergetics, mechanisms, and chemistry. Lectures will cover major principles in the biochemistry of metabolism and also highlight selected topics including signaling, transport, metabolic engineering, and human diseases related to metabolic dysfunction. The course is designed for majors in the biochemistry and molecular biology, genetics and development, or immunology emphases.

Biochemistry: Pathways, Mechanisms, and Regulation: Read More [ + ]

### Rules & Requirements

**Prerequisites:** C100A/Chemistry C130

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Savage, Zoncu, Marletta

Biochemistry: Pathways, Mechanisms, and Regulation: Read Less [ - ]

## MCELLBI C100A Biophysical Chemistry: Physical Principles and the Molecules of Life 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Thermodynamic and kinetic concepts applied to understanding the chemistry and structure of biomolecules (proteins, DNA, and RNA). Molecular distributions, reaction kinetics, enzyme kinetics. Bioenergetics, energy transduction, and motor proteins. Electrochemical potential, membranes, and ion channels.

Biophysical Chemistry: Physical Principles and the Molecules of Life: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Chemistry 3A or 112A, Mathematics 1A, Biology 1A and 1AL; Chemistry 3B or 112B recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 8 weeks - 5.5 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Also listed as:** CHEM C130

Biophysical Chemistry: Physical Principles and the Molecules of Life: Read Less [ - ]

## MCELLBI 102 Survey of the Principles of Biochemistry and Molecular Biology 4 Units

Terms offered: Fall 2021, Summer 2021 8 Week Session, Spring 2021

A comprehensive survey of the fundamentals of biological chemistry, including the properties of intermediary metabolites, the structure and function of biological macromolecules, the logic of metabolic pathways (both degradative and biosynthetic) and the molecular basis of genetics and gene expression.

Survey of the Principles of Biochemistry and Molecular Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A, 1AL, and Chemistry 3B (or equivalent courses). Recommended: a course in physical chemistry

**Credit Restrictions:** Students will receive no credit for 102 after taking 100B or C100A/Chemistry C130 or Chemistry 135.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Summer:

8 weeks - 6 hours of lecture and 2 hours of discussion per week

10 weeks - 4 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Survey of the Principles of Biochemistry and Molecular Biology: Read Less [-]

## MCELLBI C103 Bacterial Pathogenesis 3 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course for upper division and graduate students will explore the molecular and cellular basis of microbial pathogenesis. The course will focus on model microbial systems which illustrate mechanisms of pathogenesis. Most of the emphasis will be on bacterial pathogens of mammals, but there will be some discussion of viral and protozoan pathogens. There will be an emphasis on experimental approaches. The course will also include some aspects of bacterial genetics and physiology, immune response to infection, and the cell biology of host-parasite interactions.

Bacterial Pathogenesis: Read More [+]

### Rules & Requirements

**Prerequisites:** MCELLBI 100, 102 or consent of instructor

**Credit Restrictions:** Students will receive no credit for MCELLBI C103 after completing PB HLTH 262.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Portnoy

**Also listed as:** PLANTBI C103

Bacterial Pathogenesis: Read Less [-]

## MCELLBI 104 Genetics, Genomics, and Cell Biology 4 Units

Terms offered: Fall 2021, Summer 2021 8 Week Session, Spring 2021  
This course will introduce students to key concepts in genetic analysis, eukaryotic cell biology, and state-of-the-art approaches in genomic medicine. Lectures will highlight basic knowledge of cellular processes with the basis for human diseases, particularly cancer. Prerequisite courses will have introduced students to the concepts of cells, the central dogma of molecular biology, and gene regulation. Emphasis in this course will be on eukaryotic cell processes, including cellular organization, dynamics, and signaling.

Genetics, Genomics, and Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** 102

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 8 weeks - 6 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Genetics, Genomics, and Cell Biology: Read Less [-]

## MCELLBI 110 Molecular Biology: Macromolecular Synthesis and Cellular Function 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020  
Molecular biology of prokaryotic and eukaryotic cells and their viruses. Mechanisms of DNA replication, transcription, translation. Structure of genes and chromosomes. Regulation of gene expression. Biochemical processes and principles in membrane structure and function, intracellular trafficking and subcellular compartmentation, cytoskeletal architecture, nucleocytoplasmic transport, signal transduction mechanisms, and cell cycle control.

Molecular Biology: Macromolecular Synthesis and Cellular Function: Read More [+]

### Rules & Requirements

**Prerequisites:** C100A (may not be taken concurrently); Plan 1 Emphasis 1 (BMB) majors should take 100B prior to 110

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Molecular Biology: Macromolecular Synthesis and Cellular Function: Read Less [-]

## MCELLBI C110L General Biochemistry and Molecular Biology Laboratory 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020  
Experimental techniques of biochemistry and molecular biology, designed to accompany the lectures in Molecular and Cell Biology 100B and 110. General Biochemistry and Molecular Biology Laboratory: Read More [+]

### Rules & Requirements

**Prerequisites:** 110 (may be taken concurrently)

### Hours & Format

**Fall and/or spring:** 15 weeks - 2-2 hours of lecture and 6-8 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Also listed as:** CHEM C110L

General Biochemistry and Molecular Biology Laboratory: Read Less [-]

## MCELLBI C112 General Microbiology 4 Units

Terms offered: Fall 2021, Summer 2021 10 Week Session, Fall 2020  
This course will explore the molecular bases for physiological and biochemical diversity among members of the two major domains, Bacteria and Archaea. The ecological significance and evolutionary origins of this diversity will be discussed. Molecular, genetic, and structure-function analyses of microbial cell cycles, adaptive responses, metabolic capability, and macromolecular syntheses will be emphasized. General Microbiology: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A and 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 10 weeks - 5 hours of lecture and 1.5 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Ryan

**Also listed as:** PLANTBI C112

General Microbiology: Read Less [-]

## MCELLBI C112L General Microbiology Laboratory 2 Units

Terms offered: Fall 2021, Summer 2021 10 Week Session, Spring 2021

Experimental techniques of microbiology designed to accompany the lecture in C112 and C148. The primary emphasis in the laboratory will be on the cultivation and physiological and genetic characterization of bacteria. Laboratory exercises will include the observation, enrichment, and isolation of bacteria from selected environments.

General Microbiology Laboratory: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** C112 (may be taken concurrently)

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of laboratory and 1 hour of discussion per week

**Summer:** 10 weeks - 6 hours of laboratory and 1.5 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructors:** Komeili, Traxler

**Also listed as:** PLANTBI C112L

General Microbiology Laboratory: [Read Less](#) [-]

## MCELLBI C114 Introduction to Comparative Virology 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course will provide a comparative overview of virus life cycles and strategies viruses use to infect and replicate in hosts. We will discuss virus structure and classification and the molecular basis of viral reproduction, evolution, assembly, and virus-host interactions. Common features used during virus replication and host cellular responses to infection will be covered. Topics also included are common and emerging virus diseases, their control, and factors affecting their spread.

Introduction to Comparative Virology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Introductory chemistry (Chemistry 1A or 3A-3B or equivalent) and introductory biology (Biology 1A, 1AL, and 1B or equivalent) and general biochemistry (Molecular and Cell Biology C100A or equivalent--preferably completed but may be taken concurrently)

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Glaunsinger

**Also listed as:** ESPM C138/PLANTBI C114

Introduction to Comparative Virology: [Read Less](#) [-]

## MCELLBI C116 Microbial Diversity 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

This course for upper-division and graduate students will broadly survey myriad types of microbial organisms, both procaryote and eucaryote, using a phylogenetic framework to organize the concept of "biodiversity." Emphasis will be on the evolutionary development of the many biochemical themes, how they mold our biosphere, and the organisms that affect the global biochemistry. Molecular mechanisms that occur in different lineages will be compared and contrasted to illustrate fundamental biological strategies. Graduate students additionally should enroll in C216, Microbial Diversity Workshop.

Microbial Diversity: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Upper-division standing. C112 or consent of instructor and organic chemistry (may be taken concurrently)

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Coates

**Formerly known as:** 116

**Also listed as:** PLANTBI C116

Microbial Diversity: [Read Less](#) [-]

## MCELLBI 118 The Cancer Karyotype: What it is and What it Does 1 Unit

Terms offered: Fall 2019, Spring 2019, Fall 2018

The prevailing mutation theory holds that 3-6 gene mutations convert normal to cancer cells. But, this theory does not explain why cancers: 1) are autonomous and immortal – unlike any conventional mutations; 2) have individual clonal karyotypes and parallel clonal transcriptomes – much like conventional species; 3) Carcinogens generate cancer only after conspicuous latent periods of years to decades – but mutations change phenotypes immediately; 4) are at once clonal and heterogeneous within clonal margins; and 5) form metastatic and drug-resistant subspecies with variant karyotypes. To explain these unexplained characteristics, this course tests a new theory that carcinogenesis is a form of speciation.

The Cancer Karyotype: What it is and What it Does: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** 102. 104 recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Duesberg

The Cancer Karyotype: What it is and What it Does: [Read Less](#) [-]



## MCELLBI 130 Cell and Systems Biology 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course will provide a detailed discussion of a wide range of topics in cell biology emphasizing experimental approaches and key experiments that have provided important insights. The course is aimed at conveying an understanding of how cellular structure and function arise as a result of the properties of cellular macromolecules. An emphasis will be placed on the dynamic nature of cellular organization and will include a description of physical properties of cells (dimensions, concepts of free energy, diffusion, biophysical properties). Students will be introduced to quantitative aspects of cell biology and a view of cellular function that is based on integrating multiple pathways and modes of regulation (systems biology).

Cell and Systems Biology: Read More [ + ]

### Rules & Requirements

**Prerequisites:** 102 and 104. Instructors may waive 104 prerequisite for non-Molecular and Cell Biology majors

**Credit Restrictions:** Students will receive no credit for 130A after taking 130.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Formerly known as:** Molecular and Cell Biology 130A

Cell and Systems Biology: Read Less [ - ]

## MCELLBI 132 Biology of Human Cancer 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

The course is designed for students interested in learning about the molecular and cell biology of cancer and how this knowledge is being applied to the prevention, diagnosis and therapy of cancer. Topics covered include tumor pathology and epidemiology; tumor viruses and oncogenes; intracellular signaling; tumor suppressors; multi-step carcinogenesis and tumor progression; genetic instability in cancer; tumor-host interactions; invasion and metastasis; tumor immunology; cancer therapy.

Biology of Human Cancer: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Biology 1A, 1AL, 1B and MCELLBI 102; MCELLBI 110 or 104 (may be taken concurrently)

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Formerly known as:** 135G

Biology of Human Cancer: Read Less [ - ]

## MCELLBI 133L Physiology and Cell Biology Laboratory 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Experimental analyses of central problems in cell biology and physiology using modern techniques, including DNA cloning and protein biochemistry, fluorescence microscopy of the cytoskeleton and organelles, DNA transfection and cell cycle analysis of cultured mammalian cells, RNA interference and drug treatments to analyze ion channel function in cell contractility and intracellular signaling, and somatosensation.

Physiology and Cell Biology Laboratory: Read More [ + ]

### Rules & Requirements

**Prerequisites:** MCELLBI 104 recommended (may be taken concurrently)

**Credit Restrictions:** Students will receive no credit for 133L after taking 130L.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture and 7 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Physiology and Cell Biology Laboratory: Read Less [ - ]

## MCELLBI C134 Chromosome Biology/Cytogenetics 3 Units

Terms offered: Spring 2021, Spring 2019, Spring 2018

Survey of behavior, structure, and function of chromosomes with emphasis on behavior in model organisms. Topics include mitosis, meiosis, chromosome aberrations, genome function, dosage compensation, transposons, repetitive DNA, and modern cytological imaging.

Chromosome Biology/Cytogenetics: Read More [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Dernburg, Karpen

**Also listed as:** PLANTBI C134

Chromosome Biology/Cytogenetics: Read Less [\[-\]](#)

## MCELLBI 135A Topics in Cell and Developmental Biology: Molecular Endocrinology 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Molecular mechanisms by which hormones elicit specific responses and regulate gene expression; hormone-receptor interaction; synthesis, transport and targeting of hormones, growth factors and receptors. Topics in Cell and Developmental Biology: Molecular Endocrinology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology 102, Biology 1A, 1AL, 1B, Chemistry 3A-3B or equivalent, or consent of instructor

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 135A after taking Physiology 142.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Firestone

Topics in Cell and Developmental Biology: Molecular Endocrinology: Read Less [\[-\]](#)

## MCELLBI 136 Physiology 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Principles of mammalian (primarily human) physiology emphasizing physical, chemical, molecular and cellular bases of functional biology. The following topics will be covered: cellular and membrane ion and nonelectrolyte transport; cell and endocrine regulation; autonomic nervous system regulation; skeletal, smooth and cardiac muscle; cardiovascular physiology; respiration; renal physiology; gastrointestinal physiology. Discussion section led by Graduate Student Instructor will review material covered in lecture.

Physiology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A, 1AL, 1B, Physics 8A. Physics 8B recommended

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 136 after completing Integrative Biology 132.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Summer:

6 weeks - 8 hours of lecture and 3 hours of discussion per week

8 weeks - 6 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Physiology: Read Less [\[-\]](#)

## MCELLBI 137L Physical Biology of the Cell 4 Units

Terms offered: Spring 2020, Spring 2019, Spring 2017

Biology is being revolutionized by new experimental techniques that have made it possible to measure the inner workings of molecules, cells and multicellular organisms with unprecedented precision. The objective of this course is to explore this deluge of quantitative data through the use of biological numeracy. We will develop theoretical models that make precise predictions about biological phenomena. These predictions will be tested through the hands-on analysis of experimental data and by performing numerical simulations using Matlab. A laptop is required for this course, but no previous programming experience is required.

Physical Biology of the Cell: Read More [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of laboratory per week

**Summer:** 8 weeks - 6 hours of lecture and 2 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Garcia

Physical Biology of the Cell: Read Less [\[-\]](#)

## MCELLBI 140 General Genetics 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

An in depth introduction to genes, their sexual and asexual transmission in individuals and populations, and gene regulation in prokaryotes and eukaryotes. Gene manipulation by recombination, molecular cloning and genome editing is presented in contexts ranging from fundamental mechanisms of chromosome biology to applications in development, aging and disease. Human genetic variation and quantitative evaluation are illuminated. Non-Mendelian and epigenetic modes of inheritance of transposable elements, prions and chromatin states are paired with discussions of groundbreaking technology rewriting the rules of how the genome is analyzed, with attention to the ethical considerations ranging from the history of eugenics to modern controversies.

General Genetics: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Biology 1A and 1AL

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

General Genetics: Read Less [ - ]

## MCELLBI 140L Genetics Laboratory 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Experimental techniques in classical and molecular genetics.

Genetics Laboratory: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology 104 or 140. May be taken concurrently

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Genetics Laboratory: Read Less [ - ]

## MCELLBI 141 Developmental Biology 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

An introduction to principles and processes of embryonic and post-embryonic development, stressing mechanisms of cell and tissue interactions, morphogenesis and regulation of gene expression.

Developmental Biology: Read More [ + ]

### Rules & Requirements

**Prerequisites:** 102 or C100A; Biology 1A, 1AL, and 1B; 110 or 130 recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Formerly known as:** 131

Developmental Biology: Read Less [ - ]

## MCELLBI 143 Evolution of Genomes, Cells, and Development 3 Units

Terms offered: Fall 2016, Fall 2015, Fall 2014

This course is intended for upper-division undergraduates seeking an interactive course based on modern concepts in evolution and comparative genomics. The course will emphasize the contribution of molecular evolution to a series of seminal events in life's history: origin of life; origin of cells; origin of eukaryotes; origin of multicellularity; evolution of animal development; human origins.

Evolution of Genomes, Cells, and Development: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B and Molecular and Cell Biology C100A or 102; 104 or 140 recommended

**Credit Restrictions:** Student will receive no credit for 143 after taking Integrative Biology 163.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructors:** King, Levine, Patel

Evolution of Genomes, Cells, and Development: Read Less [ - ]

## MCELLBI C148 Microbial Genomics and Genetics 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Course emphasizes bacterial and archaeal genetics and comparative genomics. Genetics and genomic methods used to dissect metabolic and development processes in bacteria, archaea, and selected microbial eukaryotes. Genetic mechanisms integrated with genomic information to address integration and diversity of microbial processes. Introduction to the use of computational tools for a comparative analysis of microbial genomes and determining relationships among bacteria, archaea, and microbial eukaryotes.

Microbial Genomics and Genetics: Read More [a+]

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology C100A/Chemistry C130 or Molecular and Cell Biology 102

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Summer:

8 weeks - 6 hours of lecture and 2 hours of discussion per week

10 weeks - 5 hours of lecture and 1.5 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Brenner, Taga

**Also listed as:** PLANTBI C148

Microbial Genomics and Genetics: Read Less [-]

## MCELLBI 149 The Human Genome 3 Units

Terms offered: Fall 2021, Fall 2020, Spring 2019

This is an upper division course for majors in MCB with an interest in an in-depth exploration of the forces that shape the human genome and the human population, as well as the ways that human genetic information can be used in medicine, ancestry and forensics. The course will combine lectures and discussion of research papers.

The Human Genome: Read More [a+]

### Rules & Requirements

**Prerequisites:** MCB 140, MCB 104 or equivalent

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructors:** Eisen, Meyer, Rokhsar

The Human Genome: Read Less [-]

## MCELLBI 150 Molecular Immunology 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Fundamentals of immunology with emphasis on biochemical and molecular approaches to study of the immune system and its application in medicine and biotechnology. Topics covered include description of the immune system, antibody and T-cell receptor structure and function, genes of the immunoglobulin superfamily, cells and molecular mediators that regulate the immune response, allergy, autoimmunity, immunodeficiency, tissue and organ transplants, and tumor immunology. Molecular Immunology: Read More [a+]

### Rules & Requirements

**Prerequisites:** C100A/Chemistry C130, or 102

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Molecular Immunology: Read Less [-]

## MCELLBI 150L Immunology Laboratory 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Experimental techniques in mammalian molecular biology and cellular immunology. Molecular techniques covered include PCR and recombinant DNA procedures such as gene cloning, gene transfer, DNA sequencing, Southern blot, and restriction mapping. Immunological techniques covered include cell culture and monoclonal antibody production, flow cytometry, ELISA, immunoprecipitation, and western blot.

Immunology Laboratory: Read More [a+]

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology 150 (may be taken concurrently); consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 8 hours of laboratory and 1 hour of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Formerly known as:** Microbiology 103L

Immunology Laboratory: Read Less [-]

## MCELLBI 153 Molecular Therapeutics 4 Units

Terms offered: Fall 2021

The overarching goal of MCB 153 is to inform our MCB majors how therapeutics are developed and created. After completing this course, students will have a firm understanding on the mechanism of action of several therapies used to fight disease. The course will cover areas such as the discovery and refinement of antibiotics, anti-virals, cancer therapies, CRISPR0-based therapies. Furthermore, MCB 153 will delve into disease areas not covered in other courses, such as autoimmune diseases, cardiovascular diseases and neurological disease. Lastly, MCB 153 will implement a “case study” for each topic displaying real world challenges and solutions to treating complex diseases.

Molecular Therapeutics: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A, Molecular and Cell Biology 102, Molecular and Cell Biology C100A or Chemistry 135

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Dillin, Stanley

Molecular Therapeutics: Read Less [\[-\]](#)

## MCELLBI 160 Cellular and Molecular Neurobiology 4 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Comprehensive introductory survey of cellular and molecular neuroscience, including cellular neurophysiology, ion channel function, synaptic function and plasticity, sensory transduction, and brain development. Includes introduction to molecular basis of neurological disease. Analysis from the level of molecules to cells to simple circuits.

Cellular and Molecular Neurobiology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A and 1AL. Prerequisite or co-requisite: Physics 8B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Formerly known as:** Molecular and Cell Biology C160/Neuroscience C160

Cellular and Molecular Neurobiology: Read Less [\[-\]](#)

## MCELLBI 160L Neurobiology Laboratory 4 Units

Terms offered: Fall 2021, Fall 2020, Spring 2020

Experimental analyses of properties and interactions of nerve cells and systems, illustrating principal features and current methods. Techniques employed include computer simulation of neuron properties, electrophysiological recording and stimulation of nerves and cells, digitally enhanced video imaging of outgrowth, fluorescence immunocytochemistry, analysis of sensory: CNS mapping, human-evoked potential recording, sensory psychophysics.

Neurobiology Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A, 1AL; Physics 8A, 8B; MCB 160 or equivalent (may be taken concurrently). Recommended: a course in physical chemistry

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture and 8 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Neurobiology Laboratory: Read Less [\[-\]](#)

## MCELLBI 161 Circuit, Systems and Behavioral Neuroscience 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Comprehensive survey of circuits and systems neuroscience, including sensory and motor systems, learning and memory, neuromodulatory systems and brain state and higher functions.

Biological and computational principles of neural circuit function. Analysis from the level of small circuits to behavior.

Circuit, Systems and Behavioral Neuroscience: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology 160

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Circuit, Systems and Behavioral Neuroscience: Read Less [\[-\]](#)

## MCELLBI 163L Mammalian Neuroanatomy Lab 4 Units

Terms offered: Spring 2021, Fall 2019, Fall 2018

Development, structure (gross and microscopic), and functional relationships of the mammalian nervous system.

Mammalian Neuroanatomy Lab: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A/1AL, Molecular and Cell Biology 160 but can be taken concurrently. Molecular and Cell Biology 161 is recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructors:** Roelink, Lammell, Ball

Mammalian Neuroanatomy Lab: Read Less [-]

## MCELLBI 165 Neurobiology of Disease 3 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

The molecular, cellular, and neural circuit basis of neurological disease.

Includes neurochemistry and reward systems, neural development and its disorders, addiction, neurodegenerative and neuropsychiatric disorders. Students will read and discuss primary papers from the research literature.

Neurobiology of Disease: Read More [+]

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology 160

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Caporale

Neurobiology of Disease: Read Less [-]

## MCELLBI 166 Biophysical Neurobiology 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Electrochemistry and ion transport phenomena, equivalent circuits, excitability, action potentials, voltage clamp and the Hodgkin-Huxley model. Biophysical properties of ion channels. Statistical and electrophysiological models of synaptic transmission, Quantitative models for dendritic structure and neuronal morphogenesis. Sensory transduction, cellular networks as computational devices, information processing and transfer.

Biophysical Neurobiology: Read More [+]

### Objectives & Outcomes

#### Course Objectives: 1)

Derive equations for Nernst and GHK membrane potential from fundamental physics concepts.

2)

Describe the experiments and theory underlying the Hodgkin-Huxley model.

3)

Understand biophysical properties of gating particles called ion channels.

4)

Apply and solve equivalent circuit models to describe resting and excitable cells, synaptic transmission and sensory transduction.

5)

Use Poisson, Gaussian and binomial distributions to analyze the gating of ion channels, synaptic transmission, and absolute sensitivity of vision.

6)

Model dendritic structure based on quantitative descriptors of shape and energy minimization theory.

7)

Explain experiments and models of sensory transduction, neuronal integration and lateral inhibition.

### Rules & Requirements

**Prerequisites:** Biology 1A, 1AL, Physics 8A-8B, Chemistry 1A, 3A/3AL-3B, or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Elul, Isacoff, Miller

Biophysical Neurobiology: Read Less [-]



## MCELLBI 170L Molecular and Cell Biology Laboratory 4 Units

Terms offered: Summer 2021 First 6 Week Session, Summer 2020 First 6 Week Session, Summer 2019 First 6 Week Session

This laboratory class is designed for molecular biology, cell biology and genetics majors to give them an overview of techniques and applications done in these three fields. This is an intense lab class, and you have to be ready to work at a fast pace throughout the 6 weeks span of the course.

Molecular and Cell Biology Laboratory: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology 102, 104, 110 or 140

**Credit Restrictions:** Students will receive no credit for Molecular and Cell Biology 170L after taking Molecular and Cell Biology 133L, 140L or C110L/Chemistry C110L

### Hours & Format

**Summer:** 6 weeks - 5 hours of lecture and 14 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructor:** Le Blanc

Molecular and Cell Biology Laboratory: [Read Less](#) [-]

## MCELLBI C175 Life Sciences, Business, and Entrepreneurship Capstone Course 4 Units

Terms offered: Not yet offered

Blended lecture / Project-based course where student teams build out a business plan for a mock biotech company, demonstrating advanced knowledge in therapeutics and business development. Throughout the course student teams will work toward a final project in which they will identify and present a technology overview, disease overview and explanation of unmet need, a development plan, a commercialization plan, risk mitigation strategy, and financials. Class will include field trips, guest lectures, and a pitch competition with prize.

Life Sciences, Business, and Entrepreneurship Capstone Course: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Students must be in their fourth and final year of the Life Sciences, Business, and Entrepreneurship Program in order to enroll in this class

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructors:** Schaletzky, Dillin

**Also listed as:** UGBA C195C

Life Sciences, Business, and Entrepreneurship Capstone Course: [Read Less](#) [-]



## MCELLBI 180 Undergraduate Teaching of Biology 1A Laboratory 1 or 2 Units

Terms offered: Spring 2012, Spring 2007, Fall 2006

Course consists of a weekly three-hour training session that focuses on laboratory techniques, instructional aids, and problem solving, plus an additional three hour weekly laboratory where the UGSI is required to assist a GSI in the instruction of laboratory (answering questions, providing demonstrations, etc.).

Undergraduate Teaching of Biology 1A Laboratory: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A, 1AL with a minimum grade of B.

Appointment as a UGSI in biology by consent of instructor. Restricted to undergraduate students

**Repeat rules:** Course may be repeated for credit up to a total of 4 units.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3-6 hours of session per week

**Summer:** 8 weeks - 6-12 hours of session per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Undergraduate Teaching of Biology 1A Laboratory: [Read Less](#) [-]

## MCELLBI 180C Undergraduate Teaching of Molecular and Cell Biology 32 Laboratory 1 - 2 Units

Terms offered: Fall 2012, Fall 2011, Fall 2010

Course consists of a weekly three-hour training session that focuses on laboratory techniques, instructional aids, and problem solving, plus an additional three-hour weekly laboratory where the UGSI is required to assist a GSI in the instruction of laboratory (answering questions, providing demonstrations, etc.). Students will be graded on lecture and laboratory attendance and preparation of one quiz.

Undergraduate Teaching of Molecular and Cell Biology 32 Laboratory: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** 32, 136, or Integrative Biology 132 and Molecular and Cell Biology 32L or Integrative Biology 132L laboratory courses in physiology with minimum grades of B. Appointment as a UGSI in physiology by consent of instructor

**Repeat rules:** Course may be repeated for credit up to a total of 4 units.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3-6 hours of session per week

### Summer:

6 weeks - 7.5-15 hours of session per week

8 weeks - 5.5-11 hours of session per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

Undergraduate Teaching of Molecular and Cell Biology 32 Laboratory: [Read Less](#) [-]

## MCELLBI N184 Intro to CRISPR: From Basic Biology to Genome Editing Technology 1 Unit

Terms offered: Summer 2021 3 Week Session, Summer 2020 3 Week Session, Summer 2019 3 Week Session

This 3 week course will address topics in genome editing and CRISPR-Cas9 research, including basic and enhanced CRISPR methods, cellular repair mechanisms, regulation of gene expression, bioinformatics, applications to various organisms, and bioethics. Students will learn from a collection of local experts about ongoing campus research, and gain the background knowledge to understand current publications and applications of genome editing.

Intro to CRISPR: From Basic Biology to Genome Editing Technology:

[Read More](#) [+]

### Rules & Requirements

**Prerequisites:** BIOLOGY 1A or equivalent

### Hours & Format

**Summer:** 3 weeks - 4 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

**Instructors:** Hockemeyer, Wilson

Intro to CRISPR: From Basic Biology to Genome Editing Technology:

[Read Less](#) [-]

## MCELLBI N184L Intro to CRISPR Lab: From Basic Biology to Genome Editing Technology 1 Unit

Terms offered: Summer 2019 3 Week Session

This 3 week lab course will focus on applications of CRISPR technology as a platform for genome editing and functional genomics. The program will consist of a hands-on laboratory experience demonstrating how CRISPR systems work in situ, as well as use genome editing both in vitro and in vivo. Students will utilize fundamental molecular biology techniques and learn additional protocols specific to genome editing. Two bioinformatics based lessons will cover the essential programs and analyses used in the genome editing field. This course requires concurrent enrollment in a lecture component (MCELLBI N184), where lecturers will address topics in genome editing and CRISPR-Cas9 research.

Intro to CRISPR Lab: From Basic Biology to Genome Editing Technology:

[Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A/1AL or equivalent course. MCELLBI N184 (may be taken concurrently)

### Hours & Format

**Summer:** 3 weeks - 14 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

**Instructors:** Hockemeyer, Wilson

Intro to CRISPR Lab: From Basic Biology to Genome Editing Technology:

[Read Less](#) [-]

## MCELLBI 191 Senior Research Thesis 3 Units

Terms offered: Spring 2021, Spring 2020

This course is intended for advanced undergraduates wishing to pursue independent research projects under the mentorship of an Molecular and Cell Biology faculty member. To apply for MCELLBI 191, the research project must be rigorous and provide significant training in biology.

Senior Research Thesis: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor and departmental adviser

**Credit Restrictions:** Students will receive no credit for MCELLBI 191 after completing MCELLBI H196B, or MCELLBI H196A.

### Hours & Format

**Fall and/or spring:** 15 weeks - 9 hours of independent study per week

### Summer:

6 weeks - 23 hours of independent study per week

8 weeks - 17 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

Senior Research Thesis: Read Less [-]

## MCELLBI 194 Undergraduate Student Instructor for Molecular and Cell Biology Courses 1 - 2 Units

Terms offered: Fall 2018, Fall 2017

UGSIs will work under supervision of instructor and/or GSI. The UGSI will attend three hours of lecture per week where they will assist a GSI in instruction (answering questions, providing demonstrations, facilitating activities, etc.). In addition, UGSIs will meet with students from their section for zero to three hours of tutoring per week depending on the number of units. UGSIs do not evaluate students' work or assign grades. UGSIs will be graded on attendance and preparation of one lesson plan and one quiz. Required to attend any mandatory preparatory and review meetings.

Undergraduate Student Instructor for Molecular and Cell Biology

Courses: Read More [+]

### Rules & Requirements

**Prerequisites:** Must have completed course applying to UGSI with a grade of B or better; or consent of instructor

**Repeat rules:** Course may be repeated for credit up to a total of 4 units.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3-3 hours of lecture per week

**Summer:** 8 weeks - 6-6 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Alternative to final exam.

Undergraduate Student Instructor for Molecular and Cell Biology

Courses: Read Less [-]

## MCELLBI H196A Honors Research 1 - 4 Units

Terms offered: Fall 2015, Fall 2014, Spring 2014

Individual research and thesis preparation under the supervision of a faculty member. Acceptance to the Molecular and Cell Biology Honors Program is required. Contact the MCB Undergraduate Affairs Office, 3060 Valley Life Sciences Building, for application and details. Honor students must complete at least two semesters of research, taking a minimum of 4 units and a maximum of 8 units of H196A-196B. If desired, one semester of 199 can be used to replace H196A.

Honors Research: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Senior honors status and consent of instructor

**Repeat rules:** Course may be repeated for credit up to a total of 4 units.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of independent study per week

**Summer:** 8 weeks - 1.5-7.5 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Honors Research: Read Less [\[-\]](#)

## MCELLBI H196B Honors Research 1 - 4 Units

Terms offered: Spring 2020, Spring 2016, Spring 2015

Individual research and completion of thesis under the supervision of a faculty member. This course satisfies the thesis requirement for the Molecular and Cell Biology Department Honors Program. Contact the MCB Undergraduate Affairs Office, 3060 Valley Life Sciences Building, for program details and an application. Honor students must complete at least two semesters of research, taking a minimum of 4 units and a maximum of 8 units of H196A-196B. One semester of H196B is required.

Honors Research: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Senior honors status and consent of instructor

**Repeat rules:** Course may be repeated for credit up to a total of 4 units.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of independent study per week

**Summer:** 8 weeks - 1.5-7.5 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Honors Research: Read Less [\[-\]](#)

## MCELLBI 197 Supervised Internship 1 Unit

Terms offered: Fall 2016

Supervised experience relevant to specific topics of biology in off-campus organizations. Written report and evaluation from internship supervisor required.

Supervised Internship: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of MCB Faculty, restricted to MCB majors and prospective majors only. Certification from supervisor that credit is required

**Repeat rules:** Course may be repeated for credit with instructor consent.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of internship per week

**Summer:** 8 weeks - 6 hours of internship per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Supervised Internship: Read Less [\[-\]](#)

## MCELLBI 198 Directed Group Study 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Lectures and small group discussions focusing on topics of interest, varying from semester to semester.

Directed Group Study: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Upper division standing

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of directed group study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Directed Group Study: Read Less [\[-\]](#)

## MCELLBI 199 Supervised Independent Study and Research 1 - 4 Units

Terms offered: Fall 2021, Fall 2020, Spring 2020

Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog.

Supervised Independent Study and Research: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of independent study per week

### Summer:

6 weeks - 1-4 hours of independent study per week

8 weeks - 1-4 hours of independent study per week

10 weeks - 1-4 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Supervised Independent Study and Research: Read Less [\[-\]](#)

## MCELLBI 200A Fundamentals of Molecular and Cell Biology 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

The goal of this course is to provide graduate-level instruction on molecular and cellular biosciences from a highly-integrated systems perspective, rather than using a more classic, techniques-oriented format. A collection of approaches, and a focus on critical thinking and problem solving, will be used to show how fundamental, highly-significant biological problems are "cracked open." Reading will be assigned from a mix of classic and current peer-reviewed papers selected by the instructors.

Fundamentals of Molecular and Cell Biology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 200A and 200B must be taken concurrently. Combined course required and restricted to all MCB first-year graduate students

### Hours & Format

**Fall and/or spring:** 15 weeks - 6 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructors:** Marqusee, Rio, Drubin, Rine, Vance, Feller

Fundamentals of Molecular and Cell Biology: Read Less [\[-\]](#)

## MCELLBI 200B Fundamentals of Molecular and Cell Biology 3 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

The goal of this course is to provide graduate-level instruction on molecular and cellular biosciences from a highly-integrated systems perspective, rather than using a more classic, techniques-oriented format. A collection of approaches, and a focus on critical thinking and problem solving, will be used to show how fundamental, highly-significant biological problems are "cracked open." Reading will be assigned from a mix of classic and current peer-reviewed papers selected by the instructors.

Fundamentals of Molecular and Cell Biology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Must be taken concurrently. Combined course required for all MCB first-year graduate students

### Hours & Format

**Fall and/or spring:** 15 weeks - 6 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructors:** Marqusee, Rio, Drubin, Rine, Vance, Feller

Fundamentals of Molecular and Cell Biology: Read Less [\[-\]](#)

## MCELLBI C205 Modern Optical Microscopy for the Modern Biologist 3 Units

Terms offered: Spring 2021

This course is intended for graduate students in the early stages of their thesis research who are contemplating using modern microscopy tools as part of their work. It endeavors to cut through the confusion of the wide array of new imaging methods, with a practical description of the pros and cons of each. In addition to providing an intuitive physical understanding how these microscopes work, the course will offer hands on experience with cutting-edge microscopes where students will be able to see firsthand how different imaging modalities perform on their own samples, and where they will be able to access computational tools for the visualization and analysis of their data.

Modern Optical Microscopy for the Modern Biologist: Read More [\[+\]](#)

### Rules & Requirements

**Credit Restrictions:** Students will receive no credit for MCELLBI 205 after completing MCELLBI 205, or MCELLBI 205. A deficient grade in MCELLBI 205 may be removed by taking MCELLBI 205, or MCELLBI 205.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructors:** Betzig, Ji

**Formerly known as:** Molecular and Cell Biology 205

**Also listed as:** PHYSICS C218

Modern Optical Microscopy for the Modern Biologist: Read Less [\[-\]](#)

## MCELLBI 206 Physical Biochemistry 3 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Application of modern physical concepts and experimental methods to the analysis of the structure, function, and interaction of large molecules of biological interest.

Physical Biochemistry: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** MCB C100A or equivalent. Admission to the course requires formal consent of instructors, except for MCB and Biophysics graduate students and graduate students in the laboratories of MCB faculty

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Physical Biochemistry: Read Less [\[-\]](#)

## MCELLBI 210 Advanced Biochemistry and Molecular Biology: Macromolecular Reactions and the Cell 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

General course for first-year graduate students. Covers our current understanding of, methodological approaches for analyzing, and recent advances in the function of cellular macromolecules and macromolecular complexes in DNA replication, recombination, transposition and repair, gene expression and its regulation, mRNA splicing, genome organization, noncoding RNAs, signal transduction, protein synthesis, folding and degradation, growth control, and other life processes.

Advanced Biochemistry and Molecular Biology: Macromolecular Reactions and the Cell: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 110 or equivalent. Admission to the course requires formal consent of instructors, except for MCB graduate students and graduate students in the laboratories of MCB faculty

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Formerly known as:** 200

Advanced Biochemistry and Molecular Biology: Macromolecular Reactions and the Cell: Read Less [\[-\]](#)

## MCELLBI C212A Chemical Biology I - Structure, Synthesis and Function of Biomolecules 1 Unit

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course will present the structure of proteins, nucleic acids, and oligosaccharides from the perspective of organic chemistry. Modern methods for the synthesis and purification of these molecules will also be presented.

Chemical Biology I - Structure, Synthesis and Function of Biomolecules: Read More [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Also listed as:** CHEM C271A

Chemical Biology I - Structure, Synthesis and Function of Biomolecules: Read Less [\[-\]](#)

## MCELLBI C212B Chemical Biology II - Enzyme Reaction Mechanisms 1 Unit

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course will focus on the principles of enzyme catalysis. The course will begin with an introduction of the general concepts of enzyme catalysis which will be followed by detailed examples that will examine the chemistry behind the reactions and the three-dimensional structures that carry out the transformations.

Chemical Biology II - Enzyme Reaction Mechanisms: Read More [\[+\]](#)  
**Hours & Format**

**Fall and/or spring:** 5 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Also listed as:** CHEM C271B

Chemical Biology II - Enzyme Reaction Mechanisms: Read Less [\[-\]](#)

## MCELLBI C212C Chemical Biology III - Contemporary Topics in Chemical Biology 1 Unit

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course will build on the principles discussed in Chemical Biology I and II. The focus will consist of case studies where rigorous chemical approaches have been brought to bear on biological questions. Potential subject areas will include signal transduction, photosynthesis, immunology, virology, and cancer. For each topic, the appropriate bioanalytical techniques will be emphasized.

Chemical Biology III - Contemporary Topics in Chemical Biology: Read More [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Also listed as:** CHEM C271C

Chemical Biology III - Contemporary Topics in Chemical Biology: Read Less [\[-\]](#)

## MCELLBI C214 Protein Chemistry, Enzymology, and Bio-organic Chemistry 2 Units

Terms offered: Spring 2020, Spring 2015, Spring 2014, Spring 2013

The topics covered will be chosen from the following: protein structure; protein-protein interactions; enzyme kinetics and mechanism; enzyme design. Intended for graduate students in chemistry, biochemistry, and molecular and cell biology.

Protein Chemistry, Enzymology, and Bio-organic Chemistry: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Graduate standing or consent of instructor

### Hours & Format

**Fall and/or spring:**

10 weeks - 3 hours of lecture per week

15 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Also listed as:** CHEM C230

Protein Chemistry, Enzymology, and Bio-organic Chemistry: Read Less [\[-\]](#)

## MCELLBI C216 Microbial Diversity Workshop 1 Unit

Terms offered: Fall 2021, Fall 2020, Fall 2019

This workshop for graduate students will parallel C116, Microbial Diversity, which should be taken concurrently. Emphasis in the workshop will be on review of research literature and formulation of paper pertinent to research in microbial diversity.

Microbial Diversity Workshop: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Graduate standing; C112 or consent of instructor and organic chemistry (may be taken concurrently)

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of workshop and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructor:** Coates

**Formerly known as:** Molecular and Cell Biology C216, Plant and Microbial Biology C216

**Also listed as:** PLANTBI C216

Microbial Diversity Workshop: Read Less [\[-\]](#)



## MCELLBI 218A Mapping Metabolic Drivers of Disease using Chemoproteomic and Metabolomic Platforms 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

We will discuss current research in the following three areas: 1) mapping metabolic drivers of human diseases using chemoproteomic and metabolomic platforms; 2) expanding the druggable proteome through mapping and pharmacologically interrogating proteome-wide hyper-reactive and ligandable hotspots; 3) mapping proteome-wide targets of environmental and pharmaceutical chemicals towards understanding novel toxicological mechanisms.

Mapping Metabolic Drivers of Disease using Chemoproteomic and Metabolomic Platforms: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Nomura

Mapping Metabolic Drivers of Disease using Chemoproteomic and Metabolomic Platforms: Read Less [-]

## MCELLBI 218B Research Review in Biochemistry and Molecular Biology: Trace Elements in the Plant Lineage 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Biochemistry of Cu, Fe, Zn and Mn homeostasis and comparative genomics of algae, especially related to photosynthesis and chloroplast biology. Mechanisms of elemental sparing, including responses to N, S, and P deficiency.

Research Review in Biochemistry and Molecular Biology: Trace Elements in the Plant Lineage: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Merchant

Research Review in Biochemistry and Molecular Biology: Trace Elements in the Plant Lineage: Read Less [-]

## MCELLBI 218C Research Review in Biochemistry and Molecular Biology: Synthetic Biology and Cellular Enzymology 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Synthetic biology, metabolic engineering, systems biology, enzyme mechanism, and gene discovery.

Research Review in Biochemistry and Molecular Biology: Synthetic Biology and Cellular Enzymology: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Chang

Research Review in Biochemistry and Molecular Biology: Synthetic Biology and Cellular Enzymology: Read Less [-]

## MCELLBI 218D Research Review in Biochemistry and Molecular Biology: Gene Regulation at the RNA Level 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

RNA elements involved in alternative splicing and other co-transcriptional mechanisms of regulation. Specific areas of interest include riboswitches and other structured RNA elements involved in gene regulation.

Research Review in Biochemistry and Molecular Biology: Gene Regulation at the RNA Level: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Hammond

Research Review in Biochemistry and Molecular Biology: Gene Regulation at the RNA Level: Read Less [\[-\]](#)

## MCELLBI 218E Research Review in Biochemistry and Molecular Biology: Viruses as Models for Eukaryote Gene Expression and Replication 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Recent developments in eukaryote viral and cellular regulation. New concepts in transcription and RNA replication, with particular emphasis on virus-cell interactions.

Research Review in Biochemistry and Molecular Biology: Viruses as Models for Eukaryote Gene Expression and Replication: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Botchan

Research Review in Biochemistry and Molecular Biology: Viruses as Models for Eukaryote Gene Expression and Replication: Read Less [\[-\]](#)

## MCELLBI 218F Research Review in Biochemistry and Molecular Biology: Energy-dependent Proteases and Molecular Machines 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Our goals are to decipher the fundamental principles that govern substrate engagement, de-ubiquitylation, unfolding, and translocation by the proteasome.

Research Review in Biochemistry and Molecular Biology: Energy-dependent Proteases and Molecular Machines: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Martin

Research Review in Biochemistry and Molecular Biology: Energy-dependent Proteases and Molecular Machines: Read Less [\[-\]](#)

## MCELLBI 218H Research Review in Biochemistry and Molecular Biology: Protein Synthesis in Bacteria and Mammals 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

The mechanism of protein synthesis in bacteria and human cells. Specific areas of interest include the structure and function of the ribosome and the regulation of protein synthesis.

Research Review in Biochemistry and Molecular Biology: Protein Synthesis in Bacteria and Mammals: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Cate

Research Review in Biochemistry and Molecular Biology: Protein Synthesis in Bacteria and Mammals: Read Less [\[-\]](#)

## MCELLBI 218I Research Review in Biochemistry and Molecular Biology: Chemical Biology and Inorganic Chemistry 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research and literature topics in chemical biology and inorganic chemistry relevant to human health and disease and energy science will be discussed.

Research Review in Biochemistry and Molecular Biology: Chemical Biology and Inorganic Chemistry: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Chris Chang

Research Review in Biochemistry and Molecular Biology: Chemical Biology and Inorganic Chemistry: Read Less [\[-\]](#)

## MCELLBI 218J Research Review in Biochemistry and Molecular Biology: Advanced 20th Century Perspectives on Cancer Cell Genetics 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Transduction of cellular sequences and genetic regulation of transformation by oncogenic retroviruses as models for natural carcinogenesis, including a critical review of the current research.

Research Review in Biochemistry and Molecular Biology: Advanced 20th Century Perspectives on Cancer Cell Genetics: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Duesberg

Research Review in Biochemistry and Molecular Biology: Advanced 20th Century Perspectives on Cancer Cell Genetics: Read Less [\[-\]](#)

## MCELLBI 218K Gene Editing for Fundamental Biology and Therapeutics 2 Units

Terms offered: Fall 2020, Spring 2020, Fall 2019

The use of genome engineering to study cellular signaling (especially ubiquitin-mediated signals) and develop potential new therapeutics and diagnostics will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.

Gene Editing for Fundamental Biology and Therapeutics: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Corn

Gene Editing for Fundamental Biology and Therapeutics: Read Less [\[-\]](#)

## MCELLBI 218M Research Review in Molecular Mechanisms of Membrane Transport 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

In our laboratory, we study mechanisms by which molecules are transported across lipid bilayer membranes. Current research efforts to understand mechanisms of protein translocation across intracellular organelles and transport of other biomolecules will be discussed.

Research Review in Molecular Mechanisms of Membrane Transport: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Park

Research Review in Molecular Mechanisms of Membrane Transport: Read Less [\[-\]](#)

## MCELLBI 218N Research Review in Understanding and Exploiting Complex Biological Processes and Machines 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2010

Covers aspects of ribosome engineering, organelle imaging and interactions, protein delivery, and cell signaling.

Research Review in Understanding and Exploiting Complex Biological Processes and Machines: [Read More](#) [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Schepartz

Research Review in Understanding and Exploiting Complex Biological Processes and Machines: [Read Less](#) [\[-\]](#)

## MCELLBI 218O Research Review in Biochemistry and Molecular Biology: Chemical Biology and Enzymology 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Topics at the interface of chemistry and biology with a particular focus on mechanisms of enzyme catalysis.

Research Review in Biochemistry and Molecular Biology: Chemical Biology and Enzymology: [Read More](#) [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Marletta

Research Review in Biochemistry and Molecular Biology: Chemical Biology and Enzymology: [Read Less](#) [\[-\]](#)

## MCELLBI 218P Research Review in Biochemistry and Molecular Biology: Chemical Biology and Neuroscience 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Molecular approaches to designing and deploying tools for voltage imaging and brain mapping.

Research Review in Biochemistry and Molecular Biology: Chemical Biology and Neuroscience: [Read More](#) [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructors:** Miller, Evan

Research Review in Biochemistry and Molecular Biology: Chemical Biology and Neuroscience: [Read Less](#) [\[-\]](#)

## MCELLBI 218Q Research Review in Biochemistry and Molecular Biology: Single Molecular Imaging of Macromolecular Enzymes 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Yildiz laboratory combines molecular biology and single molecule biophysical techniques to understand mechanisms that underlie cellular organization and motility. Specific focuses of the lab are to dissect 1) the mechanism of cytoplasmic dynein motility, 2) the regulation of intraflagellar transport, and 3) the protection and maintenance of mammalian telomeres.

Research Review in Biochemistry and Molecular Biology: Single Molecular Imaging of Macromolecular Enzymes: [Read More](#) [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Yildiz

Research Review in Biochemistry and Molecular Biology: Single Molecular Imaging of Macromolecular Enzymes: [Read Less](#) [\[-\]](#)

## MCELLBI 218R Research Review in Biochemistry and Molecular Biology: The Protein Folding Problem 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Protein structure, stability, design, and the pathway of protein folding. Research Review in Biochemistry and Molecular Biology: The Protein Folding Problem: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Marqusee

Research Review in Biochemistry and Molecular Biology: The Protein Folding Problem: Read Less [ - ]

## MCELLBI 218S Research Review in Biochemistry and Molecular Biology: Cryo-Electron Microscopy of Macromolecules 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Structure-function studies of the cytoskeleton and large molecular machines by cryo-electron microscopy and image reconstruction. Research Review in Biochemistry and Molecular Biology: Cryo-Electron Microscopy of Macromolecules: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Nogales

Research Review in Biochemistry and Molecular Biology: Cryo-Electron Microscopy of Macromolecules: Read Less [ - ]

## MCELLBI 218T Electron Cryo-tomography of Macromolecular Complexes 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Different methods for determining how the in situ structure and arrangement of macromolecular complexes influence cell morphology and function will be discussed via literature review and implemented through lab-based research and discussions. Electron Cryo-tomography of Macromolecular Complexes: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Davies

Electron Cryo-tomography of Macromolecular Complexes: Read Less [ - ]

## MCELLBI 218V Research Review in Biochemistry and Molecular Biology: Biophysics of Macromolecule Transport Across Membranes 2 Units

Terms offered: Fall 2014, Spring 2014, Fall 2013

Review of current literature and discussion of original research. Research Review in Biochemistry and Molecular Biology: Biophysics of Macromolecule Transport Across Membranes: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Krantz

Research Review in Biochemistry and Molecular Biology: Biophysics of Macromolecule Transport Across Membranes: Read Less [ - ]

## MCELLBI 218X Research Review in Biochemistry and Molecular Biology: Chemical Reactions of Metabolism 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Define how metabolic reactions function in the context of the cellular system in order to elucidate the so-called design principles of metabolic function.

Research Review in Biochemistry and Molecular Biology: Chemical Reactions of Metabolism: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Savage

Research Review in Biochemistry and Molecular Biology: Chemical Reactions of Metabolism: Read Less [-]

## MCELLBI 218Z Molecular and Cellular Mechanisms of Nutrient Sensing 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

In our laboratory, we study the molecular mechanisms of nutrient sensing and growth control. Specific areas of interest include the mTOR pathway, energy sensing, lysosomal biology and translational control.

Molecular and Cellular Mechanisms of Nutrient Sensing: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Zoncu

Molecular and Cellular Mechanisms of Nutrient Sensing: Read Less [-]

## MCELLBI 219A Structural Membrane Biology 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

The mechanisms by which protein complexes use their structures to bud, bend, and sever membranes will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.

Structural Membrane Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Hurley

Structural Membrane Biology: Read Less [-]

## MCELLBI 219B Regulation of Translation 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Understanding the molecular basis and physiological role of translational regulation in gene expression with an emphasis on global profiling and functional genomics.

Regulation of Translation: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Ingolia

Regulation of Translation: Read Less [-]



## MCELLBI 219F Research Review in Biochemistry and Molecular Biology: Eukaryotic Gene Expression 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Protein-DNA interactions and the control of gene expression in eukaryotes.

Research Review in Biochemistry and Molecular Biology: Eukaryotic Gene Expression: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Tjian

Research Review in Biochemistry and Molecular Biology: Eukaryotic Gene Expression: [Read Less](#) [-]

## MCELLBI 219G Virus-Host Interactions 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Understanding the creative strategies viruses use to manipulate gene expression in host cells, with a focus on RNA-based regulation of gene expression.

Virus-Host Interactions: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Glaunsinger

Virus-Host Interactions: [Read Less](#) [-]

## MCELLBI 219H Research Review in Biochemistry and Molecular Biology: Molecular and Cell Biology of Listeria monocytogenes Pathogenesis 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Discussion of recent research on the genetics, cell biology, and immunology of the model facultative intracellular bacterial pathogen, Research Review in Biochemistry and Molecular Biology: Molecular and Cell Biology of Listeria monocytogenes Pathogenesis: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Portnoy

Research Review in Biochemistry and Molecular Biology: Molecular and Cell Biology of Listeria monocytogenes Pathogenesis: [Read Less](#) [-]

## MCELLBI 219J Research Review in Biochemistry and Molecular Biology: Structure and Function of RNA 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

RNA structure, folding, and function. Specific topics include ribozyme mechanisms, RNA-mediated translation initiation, and protein targeting and secretion.

Research Review in Biochemistry and Molecular Biology: Structure and Function of RNA: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Doudna

Research Review in Biochemistry and Molecular Biology: Structure and Function of RNA: [Read Less](#) [-]



## **MCELLBI 219K Research Review in Chemical Biology, Synthetic Biology, Organic Chemistry and Biophysics 2 Units**

Terms offered: Spring 2021, Spring 2002, Fall 2001

Discussion of recent research on chemical biology, synthetic biology, organic chemistry and biophysics.

Research Review in Chemical Biology, Synthetic Biology, Organic Chemistry and Biophysics: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Schepartz

Research Review in Chemical Biology, Synthetic Biology, Organic Chemistry and Biophysics: Read Less [\[-\]](#)

## **MCELLBI 219S Research Review in Biochemistry and Molecular Biology: Structural Biology of Signaling and Replication 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Mechanisms and structure in DNA replication and eukaryotic cell signaling.

Research Review in Biochemistry and Molecular Biology: Structural Biology of Signaling and Replication: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Kuriyan

Research Review in Biochemistry and Molecular Biology: Structural Biology of Signaling and Replication: Read Less [\[-\]](#)

## **MCELLBI 219T Research Review in Biochemistry and Molecular Biology: Signal Transduction Mechanisms 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Discussion of recent research on various aspects of signal transduction mechanisms in eukaryotic cells, including G protein-coupled receptors, protein kinase cascades, synthesis and mobilization of lipid mediators, calcium sensing and response pathways, activation and inhibition of gene expression, and the biochemical basis of signal desensitization and physiological adaptation, with strong emphasis on genetic and molecular analysis of these systems, especially in the yeast

Research Review in Biochemistry and Molecular Biology: Signal Transduction Mechanisms: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Thorner

Research Review in Biochemistry and Molecular Biology: Signal Transduction Mechanisms: Read Less [\[-\]](#)

## MCELLBI 219U Research Review in Biochemistry and Molecular Biology: Single Molecule Biophysics 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Methods of single molecule manipulation and visualization that are used to characterize the structure and mechanochemical properties of translocating DNA binding protein such as RNA polymerase and to investigate the mechanical denaturation of single protein molecules will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.

Research Review in Biochemistry and Molecular Biology: Single Molecule Biophysics: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Bustamante

Research Review in Biochemistry and Molecular Biology: Single Molecule Biophysics: [Read Less](#) [-]

## MCELLBI 219X Research Review in Biochemistry and Molecular Biology: Cell Surface Glycoconjugate Interactions 2 Units

Terms offered: Fall 2020, Spring 2018, Fall 2017

Investigations of cell surface glycoproteins as mediators of cell-cell interactions. Development of new methods for engineering cell surface structures.

Research Review in Biochemistry and Molecular Biology: Cell Surface Glycoconjugate Interactions: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Bertozzi

Research Review in Biochemistry and Molecular Biology: Cell Surface Glycoconjugate Interactions: [Read Less](#) [-]

## MCELLBI 219Y Research Review in Biochemistry and Molecular Biology: Regulation of HIV Gene Expression 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Regulation of HIV gene expression by viral proteins and cellular cofactors will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.

Research Review in Biochemistry and Molecular Biology: Regulation of HIV Gene Expression: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Zhou

Research Review in Biochemistry and Molecular Biology: Regulation of HIV Gene Expression: [Read Less](#) [-]

## MCELLBI 219Z Research Review in Biochemistry and Molecular Biology: Polymerase and RNA Biochemistry and Biology 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Emphasizes eukaryotic retroelement reverse transcriptases and retroelement mobility.

Research Review in Biochemistry and Molecular Biology: Polymerase and RNA Biochemistry and Biology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Collins

Research Review in Biochemistry and Molecular Biology: Polymerase and RNA Biochemistry and Biology: [Read Less](#) [-]

## MCELLBI 230 Advanced Cell and Developmental Biology 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course will discuss modern concepts of cell and developmental biology, with a strong emphasis on regulatory mechanisms at different length-scales (intermolecular, intracellular and intercellular). It will cover methods of quantitative, single-cell, and organismal biology in cell lines, stem cells, and model organisms. A solid foundation of core cell biology concepts, such as the cell cycle, cytoskeleton, or vesicle transport, is helpful, but not essential.

Advanced Cell and Developmental Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** 130. Formal consent of instructors required, except for MCB graduate students and graduate students in the laboratories of MCB faculty

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Advanced Cell and Developmental Biology: Read Less [-]

## MCELLBI 231 Advanced Developmental and Stem Cell Biology 4 Units

Terms offered: Spring 2018, Spring 2017, Spring 2015

Principles of animal development will be set forth from the classical and recent experimental analysis of induction, localization, patterning mutants, axis formation, regional gene expression, and cell interactions. Early development of selected vertebrates and invertebrates will be examined, and emerging topics in microRNA and stem cell biology will be highlighted. A weekly discussion section with readings from the research literature is required.

Advanced Developmental and Stem Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Previous course in development (131 or equivalent) or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1-2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Advanced Developmental and Stem Cell Biology: Read Less [-]

## MCELLBI 236 Advanced Mammalian Physiology 5 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Principles of mammalian (primarily human) physiology emphasizing physical, chemical, molecular, and cellular bases of functional biology. The following topics will be covered: cellular and membrane ion and nonelectrolyte transport; cell and endocrine regulation; autonomic nervous system regulation; skeletal, smooth, and cardiac muscle; cardiovascular physiology; respiration; renal physiology; gastrointestinal physiology. Discussion section will study advanced physiological topics, including: presentations by the faculty; problem sets; discussion of the primary literature and of reviews; two presentations by each student on topics in current physiological research.

Advanced Mammalian Physiology: Read More [-]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Advanced Mammalian Physiology: Read Less [-]

## MCELLBI 237L Advanced Physical Biology of the Cell 4 Units

Terms offered: Spring 2020, Spring 2019

Biology is being revolutionized by new experimental techniques that have made it possible to measure the inner workings of molecules, cells and multicellular organisms with unprecedented precision. The objective of this course is to explore this deluge of quantitative data through the use of biological numeracy. We will develop theoretical models that make precise predictions about biological phenomena. These predictions will be tested through the hands-on analysis of experimental data and by performing numerical simulations using Matlab. A laptop is required for this course, but no previous programming experience is required.

Advanced Physical Biology of the Cell: Read More [+]

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of laboratory per week

**Summer:** 8 weeks - 6 hours of lecture and 2 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructor:** Garcia

Advanced Physical Biology of the Cell: Read Less [-]

## MCELLBI C237 Stem Cells and Directed Organogenesis 3 Units

Terms offered: Spring 2015, Spring 2014, Spring 2013

This course will provide an overview of basic and applied embryonic stem cell (ESC) biology. Topics will include early embryonic development, ESC laboratory methods, biomaterials for directed differentiation and other stem cell manipulations, and clinical uses of stem cells.

Stem Cells and Directed Organogenesis: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 6 hours of laboratory and 1 hour of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructor:** Conboy

**Also listed as:** BIO ENG C218

Stem Cells and Directed Organogenesis: Read Less [-]

## MCELLBI 239A Research Review in Cell and Developmental Biology: Mechanisms of lipid homeostasis and lipotoxicity 2 Units

Terms offered: Fall 2007

Discussion of recent literature and original research. Current research examines the cell biology of lipid homeostasis, including the mechanisms that regulate lipid droplet biogenesis, oxidative lipid damage, and ferroptosis.

Research Review in Cell and Developmental Biology: Mechanisms of lipid homeostasis and lipotoxicity: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Olzmann

Research Review in Cell and Developmental Biology: Mechanisms of lipid homeostasis and lipotoxicity: Read Less [-]

## MCELLBI 239B Research Review in Cell and Developmental Biology: Regulation of the Cell Cycle 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research.

Research Review in Cell and Developmental Biology: Regulation of the Cell Cycle: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Rape

Research Review in Cell and Developmental Biology: Regulation of the Cell Cycle: Read Less [-]

## MCELLBI 239BB Research Review in Cell and Developmental Biology: Mechanics and Dynamics of Cell Movements 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research in our laboratory is focused on the mechanics and dynamics of cell movements on the purified protein, single cell, and tissue levels. For these studies, we are developing new instruments to quantify cell and molecular mechanics bases on optical microscopy, force microscopy, and microfabrication.

Research Review in Cell and Developmental Biology: Mechanics and Dynamics of Cell Movements: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Fletcher

Research Review in Cell and Developmental Biology: Mechanics and Dynamics of Cell Movements: Read Less [-]

## MCELLBI 239C The Regulation of Meiotic Gene Expression and Cellular Morphogenesis 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

The mechanisms that link cellular differentiation programs and dynamic gene regulation in complex eukaryotic systems remain mysterious. Such programs drive diverse and central biological processes including organismal development, immune function, disease progression, and meiosis. This course is focused on the molecular basis for the cellular remodeling accompanying meiosis, the highly conserved process by which gametes are produced.

The Regulation of Meiotic Gene Expression and Cellular Morphogenesis: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Brar

The Regulation of Meiotic Gene Expression and Cellular Morphogenesis: Read Less [-]

## MCELLBI 239EE Research Review in Cell and Developmental Biology: Cell Morphogenesis 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research. Research Review in Cell and Developmental Biology: Cell Morphogenesis: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Heald

Research Review in Cell and Developmental Biology: Cell Morphogenesis: Read Less [-]

## MCELLBI 239F Research Review in Cell and Developmental Biology: Nucleocytoplasmic Transport 2 Units

Terms offered: Spring 2015, Fall 2014, Spring 2014

Review of current literature and discussion of original research.

Research Review in Cell and Developmental Biology: Nucleocytoplasmic Transport: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Weis

Research Review in Cell and Developmental Biology: Nucleocytoplasmic Transport: Read Less [-]

## MCELLBI 239FF Research Review in Cell and Developmental Biology: Signal Transduction and Tumor Suppressor Genes 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research. Research Review in Cell and Developmental Biology: Signal Transduction and Tumor Suppressor Genes: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Luo

Research Review in Cell and Developmental Biology: Signal Transduction and Tumor Suppressor Genes: Read Less [-]



## MCELLBI 239G Research Review in Cell and Developmental Biology: Mitochondrial biology 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of relevant literature and discussion of current research: Mitochondrial dynamics, transport and inheritance; replication, segregation and distribution of mitochondrial genomes; underlying mechanisms of human mitochondrial disease.

Research Review in Cell and Developmental Biology: Mitochondrial biology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Lewis

Research Review in Cell and Developmental Biology: Mitochondrial biology: Read Less [\[-\]](#)

## MCELLBI 239HH Research Review in Cell and Developmental Biology: Mechanisms of Control of Growth and Cell Proliferation 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Identifying pathways that restrict growth and cell proliferation in vivo. Research Review in Cell and Developmental Biology: Mechanisms of Control of Growth and Cell Proliferation: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Hariharan

Research Review in Cell and Developmental Biology: Mechanisms of Control of Growth and Cell Proliferation: Read Less [\[-\]](#)

## MCELLBI 239I Research Review in Cell and Developmental Biology: Cytoskeleton and Cell Motility 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research. Research Review in Cell and Developmental Biology: Cytoskeleton and Cell Motility: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Welch

Research Review in Cell and Developmental Biology: Cytoskeleton and Cell Motility: Read Less [\[-\]](#)

## MCELLBI 239J Research Review in Cell and Developmental Biology: Steroid Hormone and Growth Factor Action 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research. Research Review in Cell and Developmental Biology: Steroid Hormone and Growth Factor Action: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Firestone

Research Review in Cell and Developmental Biology: Steroid Hormone and Growth Factor Action: Read Less [\[-\]](#)

## **MCELLBI 239K Research Review in Cell and Developmental Biology: Secretion and Cell Membrane Assembly 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Cell surface growth with emphasis on the unicellular eukaryote *S. cerevisiae*.

Research Review in Cell and Developmental Biology: Secretion and Cell Membrane Assembly: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Schekman

Research Review in Cell and Developmental Biology: Secretion and Cell Membrane Assembly: [Read Less](#) [-]

## **MCELLBI 239KK Research Review in Cell and Developmental Biology: Assembly and Subcellular Organization of Bacterial Organelles 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research.

Research Review in Cell and Developmental Biology: Assembly and Subcellular Organization of Bacterial Organelles: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Komeili

Research Review in Cell and Developmental Biology: Assembly and Subcellular Organization of Bacterial Organelles: [Read Less](#) [-]

## **MCELLBI 239M Research Review in Cell and Developmental Biology: MicroRNA Functions in Cancer Development, Mouse Tumor Models 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Malignant transformation represents the endpoint of successive genetic lesions that confer uncontrolled proliferation and survival, unlimited replicative potential, and invasive growth.

Research Review in Cell and Developmental Biology: MicroRNA Functions in Cancer Development, Mouse Tumor Models: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** He

Research Review in Cell and Developmental Biology: MicroRNA Functions in Cancer Development, Mouse Tumor Models: [Read Less](#) [-]

## **MCELLBI 239O Research Review in Cell and Developmental Biology: Cancer Biology 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Inheritance, chromatin structure, gene expression, and the organization of chromosomes in the nucleus.

Research Review in Cell and Developmental Biology: Cancer Biology: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Karpen

Research Review in Cell and Developmental Biology: Cancer Biology: [Read Less](#) [-]



## **MCELLBI 239P Research Review in Cell and Developmental Biology: Energy Metabolism and Aging 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of current research. Current research focuses on regulation of energy metabolism and the effect of changes in energy metabolism induced by diet and exercise on age-associated functional decline of organisms.

Research Review in Cell and Developmental Biology: Energy Metabolism and Aging: [Read More](#) [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Titov

Research Review in Cell and Developmental Biology: Energy Metabolism and Aging: [Read Less](#) [\[-\]](#)

## **MCELLBI 239Q Research Review in Cell and Developmental Biology: Regulation of Cell Polarity in Drosophila 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Mechanisms underlying the establishment and maintenance of cellular organization in epithelia and other cell types.

Research Review in Cell and Developmental Biology: Regulation of Cell Polarity in Drosophila: [Read More](#) [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Bilder

Research Review in Cell and Developmental Biology: Regulation of Cell Polarity in Drosophila: [Read Less](#) [\[-\]](#)

## **MCELLBI 239R Research Review in Cell and Developmental Biology: Telomere Biology of Human Stem Cells 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

The goal of our laboratory is to understand the key functions of telomeres and telomerase in tissue homeostasis, tumorigenesis, and aging. To this end, we generate genetically engineered human pluripotent and adult stem cell models to measure telomere and telomerase function during cellular differentiation and tumor formation.

Research Review in Cell and Developmental Biology: Telomere Biology of Human Stem Cells: [Read More](#) [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Hockemeyer

Research Review in Cell and Developmental Biology: Telomere Biology of Human Stem Cells: [Read Less](#) [\[-\]](#)

## MCELLBI 239T Research Review in Cell and Developmental Biology: The Cell Biology of Fertilization 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research in our lab is focused on the cell biology of mammalian fertilization. Our lab uses biophysical, biochemical, and molecular genetics methods to study sperm ion channels and transporters that regulate sperm motility, chemotaxis, and the acrosome reaction. A better understanding of these processes will eventually lead to the development of effective tools to control and preserve male fertility, improve the reproductive health of human population worldwide, and advance family planning.

Research Review in Cell and Developmental Biology: The Cell Biology of Fertilization: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Lishko

Research Review in Cell and Developmental Biology: The Cell Biology of Fertilization: Read Less [\[-\]](#)

## MCELLBI 239U Research Review in Cell and Developmental Biology: The Cytoskeleton and Morphogenesis 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of current research.

Research Review in Cell and Developmental Biology: The Cytoskeleton and Morphogenesis: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2-0 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Drubin

Research Review in Cell and Developmental Biology: The Cytoskeleton and Morphogenesis: Read Less [\[-\]](#)

## MCELLBI 239V Research Review in Cell and Developmental Biology: Molecular Mechanisms of Transduction in Touch and Pain Receptors 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of current research.

Current research focuses on elucidating the molecular mechanisms of somatosensory mechanotransduction.

Research Review in Cell and Developmental Biology: Molecular Mechanisms of Transduction in Touch and Pain Receptors: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Bautista

Research Review in Cell and Developmental Biology: Molecular Mechanisms of Transduction in Touch and Pain Receptors: Read Less [\[-\]](#)

## MCELLBI 239W Research Review in Cell and Developmental Biology: Leech Embryology and Development 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research.

Research Review in Cell and Developmental Biology: Leech Embryology and Development: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Weisblat

Research Review in Cell and Developmental Biology: Leech Embryology and Development: Read Less [\[-\]](#)

## MCELLBI 239Z Research Review in Cell and Developmental Biology: Chromosome Remodeling and Reorganization During Meiosis 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

How chromosomes are reorganized during meiosis to accomplish the pairing, recombination, and segregation leading up to successful gamete production.

Research Review in Cell and Developmental Biology: Chromosome Remodeling and Reorganization During Meiosis: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Dernburg

Research Review in Cell and Developmental Biology: Chromosome Remodeling and Reorganization During Meiosis: [Read Less](#) [-]

## MCELLBI 240 Advanced Genetic Analysis 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Principles and practice of classical and modern genetic analysis as applied to eukaryotic organisms, including yeast, nematodes, mice and humans; isolation and analysis of mutations; gene mapping; suppressor analysis; chromosome structure; control of gene expression; and developmental genetics.

Advanced Genetic Analysis: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Graduate standing with 110 or 140 or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructors:** Koshland, Meyer

Advanced Genetic Analysis: [Read Less](#) [-]

## MCELLBI C243 Seq: Methods and Applications 3 Units

Terms offered: Spring 2015, Spring 2014

A graduate seminar class in which a group of students will closely examine recent computational methods in high-throughput sequencing followed by directly examining interesting biological applications thereof.

Seq: Methods and Applications: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Graduate standing in Math, MCB, and Computational Biology; or consent of the instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructor:** Pachter

**Also listed as:** MATH C243

Seq: Methods and Applications: [Read Less](#) [-]

## MCELLBI C244 Discrete Mathematics for the Life Sciences 4 Units

Terms offered: Spring 2013

Introduction to algebraic statistics and probability, optimization, phylogenetic combinatorics, graphs and networks, polyhedral and metric geometry.

Discrete Mathematics for the Life Sciences: [Read More](#) [+]

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Also listed as:** MATH C239

Discrete Mathematics for the Life Sciences: [Read Less](#) [-]

## MCELLBI 249BB Research Review in Genetics and Development: Aging and Protein Homeostasis 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Central to the aging process is the unfolding of the proteome. Specific areas under study include cellular responses to protein misfolding and coordination of these responses across an organism.

Research Review in Genetics and Development: Aging and Protein Homeostasis: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Dillin

Research Review in Genetics and Development: Aging and Protein Homeostasis: Read Less [-]

## MCELLBI 249C Research Review in Genetics and Development: Nucleic Acid-Protein Interactions and Control of Gene Expression 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Biochemical and molecular genetic aspects of eukaryotic messenger RNA splicing and transposition, with an emphasis on an experimental system.

Research Review in Genetics and Development: Nucleic Acid-Protein Interactions and Control of Gene Expression: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Rio

Research Review in Genetics and Development: Nucleic Acid-Protein Interactions and Control of Gene Expression: Read Less [-]

## MCELLBI 249D Research Review in Genetics and Development: Mechanisms of Genetic Regulation in Yeast 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Genes, gene products and molecular mechanisms that control cell types in the unicellular eukaryote .

Research Review in Genetics and Development: Mechanisms of Genetic Regulation in Yeast: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Rine

Research Review in Genetics and Development: Mechanisms of Genetic Regulation in Yeast: Read Less [-]

## MCELLBI 249E Research Review in Genetics and Development: Molecular Genetics of Drosophila 2 Units

Terms offered: Spring 2005, Fall 2004, Spring 2004

Gene regulation and developmental neurobiology.

Research Review in Genetics and Development: Molecular Genetics of Drosophila: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** G. Rubin

Research Review in Genetics and Development: Molecular Genetics of Drosophila: Read Less [-]

## **MCELLBI 249F Research Review in Genetics and Development: Neuronal Development 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Molecular and genetic approaches to the problem of how neurons develop, with emphasis on and .

Research Review in Genetics and Development: Neuronal Development: Read More [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Garriga

Research Review in Genetics and Development: Neuronal Development: Read Less [-]

## **MCELLBI 249G Research Review in Genetics and Development: Developmental and Evolutionary Genetics 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

We study how genes control pattern formation during development and pattern modification during evolution.

Research Review in Genetics and Development: Developmental and Evolutionary Genetics: Read More [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Miller

Research Review in Genetics and Development: Developmental and Evolutionary Genetics: Read Less [-]

## **MCELLBI 249H Investigating Cellular Aging and Chromosome Segregation during Gametogenesis 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

This course focuses on understanding 1) how cellular aging is affected during gametogenesis, the developmental program that produces gametes for sexual reproduction and 2) how chromosome segregation is regulated during meiosis, the specialized cell division that generates gametes.

Investigating Cellular Aging and Chromosome Segregation during Gametogenesis: Read More [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Unal

Investigating Cellular Aging and Chromosome Segregation during Gametogenesis: Read Less [-]

## MCELLBI 249HH Research Review in Genetics and Development: Human Population Genetics and Evolutionary Biology 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research focuses on use of statistical and computational approaches to study questions in human genetics and evolutionary biology. This includes, but is not limited to, studying (1) how different evolutionary processes such as mutation rate evolve across primates, (2) when key events (such as introgression and adaptations) occurred in human history, and (3) how we can leverage large-scale datasets to identify genetic variants related to human adaptation and disease.

Research Review in Genetics and Development: Human Population Genetics and Evolutionary Biology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Moorjani

Research Review in Genetics and Development: Human Population Genetics and Evolutionary Biology: [Read Less](#) [-]

## MCELLBI 249I Research Review in Genetics and Development: RNA Systems Biology 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

How does the sequence of an RNA determine its post-transcriptional regulation? Genomic and systems biology investigations of alternative splicing, translation, and other post-transcriptional regulatory processes. Research Review in Genetics and Development: RNA Systems Biology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Lareau

Research Review in Genetics and Development: RNA Systems Biology: [Read Less](#) [-]

## MCELLBI 249J Research Review in Genetics and Development: Developmental and Molecular Genetics of *C. elegans* 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Molecular and genetical analysis of sex determination and dosage compensation in the nematode .

Research Review in Genetics and Development: Developmental and Molecular Genetics of *C. elegans*: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Meyer

Research Review in Genetics and Development: Developmental and Molecular Genetics of *C. elegans*: [Read Less](#) [-]



## **MCELLBI 249K Research Review in Genetics and Development: Animal Origins 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Evaluation of current research on choanoflagellates, sponges, and animal origins. Intended to complement ongoing research for graduate students.

Research Review in Genetics and Development: Animal Origins: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** King

Research Review in Genetics and Development: Animal Origins: Read Less [\[-\]](#)

## **MCELLBI 249L Imaging Single Molecules: Fashion or Game Changer? 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research review in genetics, genomics and development. We will explore how the detection of single particles

(DNA, RNA, proteins) can help with understanding cellular organization and

enzymatic processes dynamics and kinetics. Most of the experiments described will be drawn from the gene expression and nuclear organization literature.

Imaging Single Molecules: Fashion or Game Changer?: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Darzacq

Imaging Single Molecules: Fashion or Game Changer?: Read Less [\[-\]](#)

## **MCELLBI 249M Research Review in Genetics and Development: Saccharomyces Cerevisiae Microtubule Cytoskeleton 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of current research.

Research Review in Genetics and Development: Saccharomyces

Cerevisiae Microtubule Cytoskeleton: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Barnes

Research Review in Genetics and Development: Saccharomyces Cerevisiae Microtubule Cytoskeleton: Read Less [\[-\]](#)

## MCELLBI 249MM Physical Biology of Living Organisms 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research review in genetics, genomics and development. In development a single cell goes through a series of repeated divisions and these cells read the program encoded in their DNA in order to become familiar cell types such as those found in muscle, liver, or our brains. The goal of our lab is to uncover the rules behind these decisions with the objective of predicting and manipulating developmental programs from just looking at DNA sequence. In order to reach this predictive understanding we combine physics, synthetic biology, and new technologies to query and control developmental decisions in real time at the single cell level in the fruit fly embryo.

Physical Biology of Living Organisms: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Garcia

Physical Biology of Living Organisms: Read Less [-]

## MCELLBI 249N Research Review in Genetics and Development: Gene Regulation 2 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017

Current literature and research in gene regulation will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.

Research Review in Genetics and Development: Gene Regulation: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Levine

Research Review in Genetics and Development: Gene Regulation: Read Less [-]

## MCELLBI 249O Research Review in Genetics and Development: Genome Sequences 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Biochemistry, cancer biology and virology, cell biology, computational biology, genetics, microbiology, molecular and cell physiology.

Research Review in Genetics and Development: Genome Sequences: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Eisen

Research Review in Genetics and Development: Genome Sequences: Read Less [-]

## MCELLBI 249P Research Review in Genetics and Development: Evolution of Genome Structure and Cellular Diversity 2 Units

Terms offered: Spring 2015, Spring 2014, Fall 2013

Review of current literature and discussion of original research in the evolution of genome structure, aging, and cellular and organismal diversity.

Research Review in Genetics and Development: Evolution of Genome Structure and Cellular Diversity: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Sudmant

Research Review in Genetics and Development: Evolution of Genome Structure and Cellular Diversity: Read Less [-]

## MCELLBI 249Q Research Review in Genetics and Development: Computational Genomics 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Recent developments in computational methods for genomics and their application for understanding the structure and function of genes encoded in completely sequenced genomes.

Research Review in Genetics and Development: Computational Genomics: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Brenner

Research Review in Genetics and Development: Computational Genomics: Read Less [-]

## MCELLBI 249S Research Review in Genetics and Development: Evolution of Development Mechanisms 2 Units

Terms offered: Fall 2020, Fall 2019, Spring 2019

Evolution of development mechanisms with a focus on the genes that regulate segmentation and regionalization of the body plan.

Research Review in Genetics and Development: Evolution of Development Mechanisms: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Patel

Research Review in Genetics and Development: Evolution of Development Mechanisms: Read Less [-]

## MCELLBI 249T Research Review in Genetics, Genomics and Development: Evolution of Genomes 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Comparative analysis of eukaryotic genomes to inform the origins and diversification of animals and plants.

Research Review in Genetics, Genomics and Development: Evolution of Genomes: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Rokhsar

Research Review in Genetics, Genomics and Development: Evolution of Genomes: Read Less [-]

## **MCELLBI 249V Research Review in Genetics and Development: Induction in Vertebrate Development and ES Cell Differentiation 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

The Roelink laboratory is interested in the mechanisms of embryonic induction, the phenomenon in which a group of cells changes the developmental fate of neighboring cells via the release of inducers.

Research Review in Genetics and Development: Induction in Vertebrate Development and ES Cell Differentiation: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Roelink

Research Review in Genetics and Development: Induction in Vertebrate Development and ES Cell Differentiation: [Read Less](#) [-]

## **MCELLBI 249W Research Review in Genetics and Development: Archaeal Genetics and Methane Metabolism 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Discussions pertaining to the development of new genetic tools for archaeal model organisms with a particular emphasis on methane metabolizing archaea in order to characterize their physiology, evolution and metabolism.

Research Review in Genetics and Development: Archaeal Genetics and Methane Metabolism: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Nayak

Research Review in Genetics and Development: Archaeal Genetics and Methane Metabolism: [Read Less](#) [-]

## **MCELLBI 249X Research Review in Genetics and Development: Comparative Genomics and Computational Biology 2 Units**

Terms offered: Spring 2021, Fall 2020, Spring 2020

The fundamental problem of comparative genomics: the determination of the origins and evolutionary history of the nucleotides in all extant genomes. My work incorporates various aspects of genomics, including the reconstruction of ancestral genomes (paleogenomics), the modeling of genome dynamics (phylogenomics and systems biology), and the assignment of function of genome elements (functional genomics and epigenomics).

Research Review in Genetics and Development: Comparative Genomics and Computational Biology: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Pachter

Research Review in Genetics and Development: Comparative Genomics and Computational Biology: [Read Less](#) [-]

## MCELLBI 249Y Research Review in Genetics and Development: Mechanisms of Gene Control in Vertebrate Animals 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

This course will focus on mechanisms of gene control in vertebrate animals, particularly in the area of vertebrate development. Amphibian egg formation, mesoderm induction, neural induction, and patterning of the nervous system at the molecular level. Control of transcription, post-transcriptional control of gene expression (including control of RNA turnover and RNA localization).

Research Review in Genetics and Development: Mechanisms of Gene Control in Vertebrate Animals: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Harland

**Formerly known as:** 218Y

Research Review in Genetics and Development: Mechanisms of Gene Control in Vertebrate Animals: Read Less [\[-\]](#)

## MCELLBI 249Z Research Review in Genetics and Development: Chromosome Structure and Integrity, Genome Evolution 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Use of genetic, cell biological, and biochemical approaches in budding yeast to understand genome integrity, genome evolution, and most recently desiccation tolerance.

Research Review in Genetics and Development: Chromosome Structure and Integrity, Genome Evolution: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Koshland

Research Review in Genetics and Development: Chromosome Structure and Integrity, Genome Evolution: Read Less [\[-\]](#)

## MCELLBI 250 Advanced Immunology 4 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Molecular and cellular analysis of the immune response emphasizing concepts and methodology. Innate immunity, pathogen sensors, antibodies and T cell receptors, lymphocyte activation, tolerance and selection. Antigen processing, T cell subtypes, and T regulatory cells. NK cells, tumor surveillance, and AIDS.

Advanced Immunology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 100, 110, 140, 150 or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Advanced Immunology: Read Less [\[-\]](#)

## MCELLBI 251 The Regulation of Immune System Development and Function 1 Unit

Terms offered: Spring 2021, Fall 2020, Spring 2020

This is an advanced seminar course which will consider current research questions and experimental approaches in molecular and cellular immunology. Each registrant will present a 30-minute research talk describing the problems they are studying, the approach they are taking, their preliminary data, and technical problems. Other course participants (including basic immunology faculty) will provide criticism and suggestions.

The Regulation of Immune System Development and Function: Read More [+]

### Rules & Requirements

**Prerequisites:** 250 or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Winoto

The Regulation of Immune System Development and Function: Read Less [-]

## MCELLBI 259A Mycobacterium Tuberculosis (Mtb) 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

The TB field has entered a new era with the convergence of genetic tools, genome sequencing, bioinformatics, advanced imaging techniques, animal models of infection, and high-throughput assays that allow us to study this multi-faceted interaction between Mtb and its host. We use all of these tools to probe the molecular and cellular events that enable M. tuberculosis to evade host defense mechanisms.

Mycobacterium Tuberculosis (Mtb): Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Cox

Mycobacterium Tuberculosis (Mtb): Read Less [-]

## MCELLBI 259B Research Review in Immunology and Pathogenesis: Specificity of T Lymphocytes 2 Units

Terms offered: Spring 2019, Fall 2018, Spring 2018

Mechanisms of immune surveillance by T lymphocytes.

Research Review in Immunology and Pathogenesis: Specificity of T Lymphocytes: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Shastri

Research Review in Immunology and Pathogenesis: Specificity of T Lymphocytes: Read Less [-]

## MCELLBI 259C Research Review in Immunology and Pathogenesis: Nuclear Receptor-Mediated Regulation of Neuroinflammation 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

In this course we will discuss our research as well as recent literatures focusing on understanding of 1) How is homeostasis in the CNS regulated by innate immune functions of microglia? 2) How can we intervene in dysfunction of microglia-mediated immune functions using NRs signaling and transcription?

Research Review in Immunology and Pathogenesis: Nuclear Receptor-Mediated Regulation of Neuroinflammation: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Saijo

Research Review in Immunology and Pathogenesis: Nuclear Receptor-Mediated Regulation of Neuroinflammation: Read Less [-]



## MCELLBI 259D Research Review in Immunology and Pathogenesis: Mycobacterial Biology and Host-Pathogen Interactions 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

We will discuss macrophage biology and innate immunity in the context of infection with \*Mycobacterium tuberculosis\* through discussion of current research from the Stanley Lab and both cutting edge and classic literature in relevant fields.

Research Review in Immunology and Pathogenesis: Mycobacterial Biology and Host-Pathogen Interactions: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Stanley

Research Review in Immunology and Pathogenesis: Mycobacterial Biology and Host-Pathogen Interactions: Read Less [-]

## MCELLBI 259E Research Review in Immunology and Pathogenesis: Regulation of T Cell Receptor Genes Expression 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Molecular biology of T cell receptor genes and their transcription controlling proteins/genes. Programmed cell death during thymocyte differentiation.

Research Review in Immunology and Pathogenesis: Regulation of T Cell Receptor Genes Expression: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Winoto

Research Review in Immunology and Pathogenesis: Regulation of T Cell Receptor Genes Expression: Read Less [-]

## MCELLBI 259F Research Review in Immunology and Pathogenesis: Natural Killer (NK) Cell and T Cell Receptors 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Molecular and biological basis for recognition by natural killer cells and T cells.

Research Review in Immunology and Pathogenesis: Natural Killer (NK) Cell and T Cell Receptors: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Raulet

Research Review in Immunology and Pathogenesis: Natural Killer (NK) Cell and T Cell Receptors: Read Less [-]

## MCELLBI 259G Research Review in Immunology and Pathogenesis: T Cell Development 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Molecular and cellular aspects of thymocyte differentiation.

Research Review in Immunology and Pathogenesis: T Cell Development: Read More [+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Robey

Research Review in Immunology and Pathogenesis: T Cell Development: Read Less [-]

## **MCELLBI 259H Research Review in Immunology and Pathogenesis: B Cell Differentiation 2 Units**

Terms offered: Fall 2021, Fall 2020, Fall 2019

Molecular basis of terminal B cell differentiation. Role of transcription factors in B cell activation.

Research Review in Immunology and Pathogenesis: B Cell Differentiation: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Sha

Research Review in Immunology and Pathogenesis: B Cell Differentiation: [Read Less](#) [-]

## **MCELLBI 259J Research Review in Immunology and Pathogenesis: Immune Evasion by Viruses 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

The mechanisms used by viruses to counteract the pressure of the immune system.

Research Review in Immunology and Pathogenesis: Immune Evasion by Viruses: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Coscoy

Research Review in Immunology and Pathogenesis: Immune Evasion by Viruses: [Read Less](#) [-]

## **MCELLBI 259K Research Review in Immunology and Pathogenesis: Epigenetic Control for Regulatory T Cell Function in Cancer and Autoimmunity 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Intersecting the fields of cancer biology, immunology, and epigenetics to strengthen our own immune defense mechanisms against our own cancers by reprogramming T cell function specifically within the tumor microenvironment.

Research Review in Immunology and Pathogenesis: Epigenetic Control for Regulatory T Cell Function in Cancer and Autoimmunity: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Dupage

Research Review in Immunology and Pathogenesis: Epigenetic Control for Regulatory T Cell Function in Cancer and Autoimmunity: [Read Less](#) [-]

## **MCELLBI 259M Research Review in Immunology and Pathogenesis: Innate Immunity and Innate Control of Adaptive Immunity 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Innate immunity and innate control of adaptive immunity.

Research Review in Immunology and Pathogenesis: Innate Immunity and Innate Control of Adaptive Immunity: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Barton

Research Review in Immunology and Pathogenesis: Innate Immunity and Innate Control of Adaptive Immunity: [Read Less](#) [-]

## **MCELLBI 259N Research Review in Immunology and Pathogenesis: Immunology, Microbiology, and Genetics of Bacterial Pathogenesis 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Role of innate host responses in defense against intracellular bacterial pathogens.

Research Review in Immunology and Pathogenesis: Immunology, Microbiology, and Genetics of Bacterial Pathogenesis: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Vance

Research Review in Immunology and Pathogenesis: Immunology, Microbiology, and Genetics of Bacterial Pathogenesis: Read Less [\[-\]](#)

## **MCELLBI C261 Cellular and Developmental Neurobiology 3 Units**

Terms offered: Fall 2021, Fall 2020, Fall 2019

This course covers the molecular/cellular basis of neuron excitability (membrane potentials, action potential generation and propagation, ion channels), synaptic transmission and plasticity, sensory receptor function, and developmental neurobiology.

Cellular and Developmental Neurobiology: Read More [\[+\]](#)

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Also listed as:** NEUROSC C261

Cellular and Developmental Neurobiology: Read Less [\[-\]](#)

## **MCELLBI C262 Circuit and Systems Neurobiology 3 Units**

Terms offered: Spring 2021, Spring 2020, Spring 2019

Advanced coverage of current research problems in systems-level neuroscience, and experimental and computational techniques used for these studies.

Circuit and Systems Neurobiology: Read More [\[+\]](#)

### **Rules & Requirements**

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Also listed as:** NEUROSC C262

Circuit and Systems Neurobiology: Read Less [\[-\]](#)

## **MCELLBI 269A Research Review in Neurobiology: Special Topics in Neuroplasticity 2 Units**

Terms offered: Spring 2021, Spring 2020, Spring 2019

Molecular and cellular studies of nerve growth, axon guidance, synaptic formation, and synaptic plasticity using electrophysiological and optical imaging techniques.

Research Review in Neurobiology: Special Topics in Neuroplasticity: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Poo

Research Review in Neurobiology: Special Topics in Neuroplasticity: Read Less [\[-\]](#)

## MCELLBI 269B Research Review in Neurobiology: Synaptic Transmission and Neuromodulation 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research.

Research Review in Neurobiology: Synaptic Transmission and Neuromodulation: Read More [a+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Zucker

Research Review in Neurobiology: Synaptic Transmission and Neuromodulation: Read Less [-]

## MCELLBI 269C Research Review in Neurobiology: Molecular Mechanisms of Neuronal Plasticity 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research in our laboratory focuses on understanding how neurons use biochemical pathways to integrate diverse types of information in order to adjust synaptic strength and modulate neuronal excitability, and how these interactions go awry in disease. To investigate this we are taking a multi-disciplinary approach incorporating molecular, biochemical, imaging, and electrophysiological analyses in mouse and human cells. Research Review in Neurobiology: Molecular Mechanisms of Neuronal Plasticity: Read More [a+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Bateup

Research Review in Neurobiology: Molecular Mechanisms of Neuronal Plasticity: Read Less [-]

## MCELLBI 269D Research Review in Neurobiology: Signaling Within and Between Neurons 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of recent research in molecular mechanisms involved in intracellular and extracellular signaling in the nervous system.

Research Review in Neurobiology: Signaling Within and Between Neurons: Read More [a+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Kramer

Research Review in Neurobiology: Signaling Within and Between Neurons: Read Less [-]

## MCELLBI 269E Molecular and Biophysical Neuroscience 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of research in molecular and biophysical aspects of sensory transduction and electrical signaling in the nervous system.

Molecular and Biophysical Neuroscience: Read More [a+]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of the instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Brohawn

Molecular and Biophysical Neuroscience: Read Less [-]

## MCELLBI 269F Optogenetic Dissection of Neural Circuits 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Research review in neurobiology. Review of recent optogenetic strategies for dissecting neural connectivity, function, and dysfunction in the rodent and primate brain.

Optogenetic Dissection of Neural Circuits: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Lammel

Optogenetic Dissection of Neural Circuits: Read Less [\[-\]](#)

## MCELLBI 269G Research Review in Development and Application of Advanced Methods for In Vivo Imaging 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Development and application of optical imaging methods for clearer, deeper, and faster imaging of biological tissue in vivo, including a critical review of the current research.

Research Review in Development and Application of Advanced Methods for In Vivo Imaging: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Ji

Research Review in Development and Application of Advanced Methods for In Vivo Imaging: Read Less [\[-\]](#)

## MCELLBI 269I Research Review in Neurobiology: Stem Cells and Gene Therapy in the Nervous System 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

The basic investigation of neural differentiation of stem cells, as well as the

use of stem cells and gene delivery for neuroregeneration.

Research Review in Neurobiology: Stem Cells and Gene Therapy in the Nervous System: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Schaffer

Research Review in Neurobiology: Stem Cells and Gene Therapy in the Nervous System: Read Less [\[-\]](#)

## MCELLBI 269J Research Review in Neurobiology: Taste Recognition in Drosophila 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

The molecular and cellular basis of taste perception in the model organism .

Research Review in Neurobiology: Taste Recognition in Drosophila: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Scott

Research Review in Neurobiology: Taste Recognition in Drosophila: Read Less [\[-\]](#)

## **MCELLBI 269K Research Review in Neurobiology: Instructive Cues for Neural Form and Function 2 Units**

Terms offered: Fall 2021, Spring 2011, Fall 2010

Molecular and circuit studies of the mechanisms that specify synaptic properties and how these properties bias the timescales of neuronal computation.

Research Review in Neurobiology: Instructive Cues for Neural Form and Function: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Gomez

Research Review in Neurobiology: Instructive Cues for Neural Form and Function: Read Less [\[-\]](#)

## **MCELLBI 269M Research Review in Neurobiology: Insect Neurophysiology 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Drosophila mutants that have behavioral abnormalities to unravel new and basic features of nervous system structure and function.

Research Review in Neurobiology: Insect Neurophysiology: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Tanouye

Research Review in Neurobiology: Insect Neurophysiology: Read Less [\[-\]](#)

## **MCELLBI 269O Research Review in Neurobiology: Neural Circuits for Sensory Processing and Behavior 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Microcircuitry of the cerebral cortex that underlies sensory processing and adaptive behavior.

Research Review in Neurobiology: Neural Circuits for Sensory Processing and Behavior: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Adesnik

Research Review in Neurobiology: Neural Circuits for Sensory Processing and Behavior: Read Less [\[-\]](#)

## **MCELLBI 269Q Research Review in Neurobiology: Sensory Processing and Plasticity in Cerebral Cortex 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

How the cerebral cortex processes sensory input and stores information about the sensory world. We focus on the rat's primary somatosensory (S1) cortex.

Research Review in Neurobiology: Sensory Processing and Plasticity in Cerebral Cortex: Read More [\[+\]](#)

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Feldman

Research Review in Neurobiology: Sensory Processing and Plasticity in Cerebral Cortex: Read Less [\[-\]](#)



## **MCELLBI 269R Research Review in Neurobiology: Potassium Channels and Synaptic Plasticity 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research.

Research Review in Neurobiology: Potassium Channels and Synaptic Plasticity: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Isacoff

Research Review in Neurobiology: Potassium Channels and Synaptic Plasticity: [Read Less](#) [-]

## **MCELLBI 269S Research Review in Neurobiology: Molecular Mechanisms of Olfaction 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research.

Research Review in Neurobiology: Molecular Mechanisms of Olfaction: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Ngai

Research Review in Neurobiology: Molecular Mechanisms of Olfaction: [Read Less](#) [-]

## **MCELLBI 269T Research Review in Neurobiology: Processing of Visual Information in the Mammalian Brain 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Review of current literature and discussion of original research.

Research Review in Neurobiology: Processing of Visual Information in the Mammalian Brain: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Dan

Research Review in Neurobiology: Processing of Visual Information in the Mammalian Brain: [Read Less](#) [-]

## **MCELLBI 269U Research Review in Neurobiology: Diseases/Retina 2 Units**

Terms offered: Fall 2021, Spring 2021, Fall 2020

Evaluation of current research in molecular mechanisms underlying diseases of the retina.

Research Review in Neurobiology: Diseases/Retina: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Flannery

Research Review in Neurobiology: Diseases/Retina: [Read Less](#) [-]

## MCELLBI 269W Research Review in Neurobiology: Neural Activity Affecting the Assembly of Neural Circuits 2 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

How neural activity affects the assembly of neural circuits.

Research Review in Neurobiology: Neural Activity Affecting the Assembly of Neural Circuits: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Feller

Research Review in Neurobiology: Neural Activity Affecting the Assembly of Neural Circuits: Read Less [ - ]

## MCELLBI C277 Communicating Quantitative Information 2 Units

Terms offered: Fall 2021, Spring 2021, Spring 2020, Spring 2019

This course will cover several aspects of communicating quantitative information, with a primary focus on visualizations for publications, presentations, and posters. Other topics include sharing of data and analyses, such as new publication models and interactive notebooks, as well as lifecycle data management and publication. Primary discussion will be on conceptual issues, and students will be expected to use various systems and resources as self-directed homestudy.

Communicating Quantitative Information: Read More [ + ]

### Hours & Format

**Fall and/or spring:** 15 weeks - 1.5 hours of seminar and 1.5 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructor:** Brenner

**Also listed as:** PLANTBI C277

Communicating Quantitative Information: Read Less [ - ]

## MCELLBI 280A Selected Topics in Molecular and Cell Biology 1 Unit

Terms offered: Spring 2012, Spring 2011, Spring 2010

The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology.

Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbiology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.

Selected Topics in Molecular and Cell Biology: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Graduate standing or consent of instructor

**Repeat rules:** Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Selected Topics in Molecular and Cell Biology: Read Less [ - ]

## MCELLBI 280B Selected Topics in Molecular and Cell Biology 1 Unit

Terms offered: Spring 2012, Spring 2011, Spring 2010

The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology.

Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbiology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.

Selected Topics in Molecular and Cell Biology: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Graduate standing and consent of instructor

**Repeat rules:** Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Selected Topics in Molecular and Cell Biology: Read Less [ - ]

## MCELLBI 280C Selected Topics in Molecular and Cell Biology 1 Unit

Terms offered: Spring 2021, Spring 2016, Spring 2012

The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology.

Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbiology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.

Selected Topics in Molecular and Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing and consent of instructor

**Repeat rules:** Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Selected Topics in Molecular and Cell Biology: Read Less [-]

## MCELLBI 280D Selected Topics in Molecular and Cell Biology 1 Unit

Terms offered: Fall 2021, Fall 2020, Fall 2019

The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology.

Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbiology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.

Selected Topics in Molecular and Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing or consent of instructor

**Repeat rules:** Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Selected Topics in Molecular and Cell Biology: Read Less [-]

## MCELLBI 280E Selected Topics in Molecular and Cell Biology 1 Unit

Terms offered: Spring 2012, Spring 2011, Spring 2010

The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology.

Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbiology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.

Selected Topics in Molecular and Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing and consent of instructor

**Repeat rules:** Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Selected Topics in Molecular and Cell Biology: Read Less [-]

## MCELLBI 280F Selected Topics in Molecular and Cell Biology 1 Unit

Terms offered: Fall 2016, Spring 2012, Spring 2011

The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology.

Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbiology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.

Selected Topics in Molecular and Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing and consent of instructor

**Repeat rules:** Course may be repeated for credit when topic changes.

### Hours & Format

**Fall and/or spring:** 5 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Selected Topics in Molecular and Cell Biology: Read Less [-]

## MCELLBI 288 Data Science for Molecular and Cell Biology 3 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Data science is rapidly becoming a critical skill for molecular and cell biologists. This course provides a survey of data science concepts and methods, including practical statistical inference and modeling, data visualization and exploration, elementary machine learning, and simulation. The course is practically oriented. Diverse real-world datasets, along with simulated data, will be used to develop skills and intuition.

Data Science for Molecular and Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing in the biological sciences or permission from instructors. Prior introductory exposure to programming is desired, e.g., through Data Science 8, MCB Python “boot camp,” or self taught from introductory programming tutorials. Please see <http://python.berkeley.edu/resources/> for suggested resources. No prior statistics is assumed. The course is not suitable for students with advanced training in statistics or machine learning

**Repeat rules:** Course may be repeated for credit with instructor consent.

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructors:** Rokhsar, Eisen

Data Science for Molecular and Cell Biology: Read Less [-]

## MCELLBI 290 Graduate Seminar 1 Unit

Terms offered: Fall 2021, Spring 2021, Fall 2020

Graduate student presentations on selected research topics in molecular and cell biology. Several sections covering different topics offered each semester. Concurrent enrollment in more than one section is permitted.

List of topics to be announced before each semester.

Graduate Seminar: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing in the department or consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Graduate Seminar: Read Less [-]

## MCELLBI 291A Introduction to Research 2 - 12 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology.

Introduction to Research: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 2-12 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade. This is part one of a year long series course. A provisional grade of IP (in progress) will be applied and later replaced with the final grade after completing part two of the series.

Introduction to Research: Read Less [-]

## MCELLBI 291B Introduction to Research 2 - 12 Units

Terms offered: Spring 2021, Spring 2020, Spring 2019

Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology.

Introduction to Research: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 2-12 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade. This is part two of a year long series course. Upon completion, the final grade will be applied to both parts of the series.

Introduction to Research: Read Less [-]

## MCELLBI 292 Research 3 - 12 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Individual research under the supervision of a faculty member.

Research: Read More [ + ]

### Rules & Requirements

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Research: Read Less [ - ]

## MCELLBI N292 Research 3 - 6 Units

Terms offered: Summer 2009 10 Week Session, Summer 2008 10 Week Session, Summer 2006 10 Week Session

Individual research under the supervision of a staff member.

Research: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Summer:** 8 weeks - 3-6 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

Research: Read Less [ - ]

## MCELLBI 293A Research Seminar 2 Units

Terms offered: Fall 2021, Fall 2020, Fall 2019

Seminar on presentation and evaluation of results in area of student's individual research interests.

Research Seminar: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Concurrent enrollment in 291A or 292

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Research Seminar: Read Less [ - ]

## MCELLBI 293C Responsible Conduct in Research 1 Unit

Terms offered: Spring 2021, Spring 2020, Spring 2019

The purpose of this course is to ensure that research trainees receive ample training in Responsible Conduct in Research. Students also gain an understanding of federal, state, and UC Berkeley policies and resources available to further support their research endeavors.

Responsible Conduct in Research: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1.5 hours of lecture and 1.5 hours of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Sharma

Responsible Conduct in Research: Read Less [ - ]

## MCELLBI 293D Rigor and Reproducibility in Research 1 Unit

Terms offered: Prior to 2007

The purpose of this course is to ensure that research trainees receive training in Rigor and Reproducibility in Research. Students also gain an understanding of federal, state, and UC Berkeley policies and resources available to further support their research endeavors.

Rigor and Reproducibility in Research: Read More [ + ]

### Rules & Requirements

**Prerequisites:** Consent of Instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 1.5 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Sharma

Rigor and Reproducibility in Research: Read Less [ - ]

## MCELLBI 293R Responsible Conduct of Research Refresher 1 Unit

Terms offered: Prior to 2007

This refresher course will cover topics in responsible conduct in research drawing from case studies of the Association of American Medical Colleges and the NIH. Students will review case studies in preparation for class discussion. Required of all 4th year MCB graduate students funded on NIH training grants.

Responsible Conduct of Research Refresher: [Read More](#) [+]

### Objectives & Outcomes

**Course Objectives:** Collaborative research including collaborations with industry

Data acquisition and laboratory tools; management, sharing and ownership

Mentor/mentee responsibilities and relationships

Policies regarding human subjects, live vertebrate animal subjects in research, and safe laboratory practices

Research misconduct and policies for handling misconduct

Responsible authorship and publication

The scientist as a responsible member of society, contemporary ethical issues in biomedical research, and

the environmental and societal impacts of scientific research

### Rules & Requirements

**Prerequisites:** Consent of instructor. Must be a 4th year MCB graduate student

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructor:** Sharma

Responsible Conduct of Research Refresher: [Read Less](#) [-]

## MCELLBI 293S Foundations of Biostatistical Practice 1 Unit

Terms offered: Fall 2018, Spring 2018

This course is designed to introduce students to the foundations of statistics in the context of biological research. Rather than focusing on a catalog of specific methods (by essence non-exhaustive and rapidly outdated), the course emphasizes general concepts and approaches necessary for sound statistical practice. Topics covered include: exploratory data analysis (EDA); data visualization; inferential reasoning; models and assumptions; statistical computing; computationally reproducible research. The statistical methods and software are motivated by and illustrated on data structures that arise in current biological and medical research.

Foundations of Biostatistical Practice: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Foundations of Biostatistical Practice: [Read Less](#) [-]

## MCELLBI 294 Current Topics in Biomedical Sciences 1 Unit

Terms offered: Fall 2021, Spring 2021, Fall 2020

This course will discuss cutting-edge topics in biochemistry, structural biology, cell biology, developmental biology and genetics. Lectures will be given by internationally recognized biomedical scientists that visit the Molecular and Cell Biology Department and present work currently performed in their laboratories. The class will include topics ranging from structural analysis of important signaling molecules, live cell imaging and high resolution microscopy of critical cellular structures, to genetic dissection of essential signaling networks in cells and developmental pathways in multicellular organisms. It is the goal of this class to expose students to both the breadth and highest standards of current biomedical research.

Current Topics in Biomedical Sciences: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Molecular and Cell Biology graduate students only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Current Topics in Biomedical Sciences: [Read Less](#) [-]



## MCELLBI 295 Careers for Life Sciences Ph.D's 1 Unit

Terms offered: Spring 2021, Spring 2020, Spring 2019

This course is designed to assist graduate students in the biological sciences with planning their postgraduate careers. Weekly guest speakers will present their experiences on a variety of topics. Postdoctoral students are invited. Topics may include academia; job searches; setting up a laboratory; patent law/technology transfer; public policy/regulatory affairs; bioinformatics; science writing/technical support; forensic science; postdoctoral positions in industry; teaching, and other topics of interest.

Careers for Life Sciences Ph.D's: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Open to graduate and postdoctoral students

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Careers for Life Sciences Ph.D's: [Read Less](#) [-]

## MCELLBI 296 Molecular and Cell Biology Colloquium 0.0 Units

Terms offered: Spring 2020, Spring 2019, Spring 2018

Meetings for the presentation of original work by faculty, visiting lecturers, and graduate students.

Molecular and Cell Biology Colloquium: [Read More](#) [+]

### Hours & Format

**Fall and/or spring:** 15 weeks - 1.5 hours of colloquium per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Molecular and Cell Biology Colloquium: [Read Less](#) [-]

## MCELLBI C296 Doctoral Seminar in Computational Biology 2 Units

Terms offered: Fall 2021, Fall 2019, Fall 2018

This interactive seminar builds skills, knowledge and community in computational biology for first year PhD and second year Designated Emphasis students. Topics covered include concepts in human genetics/genomics, laboratory methodologies and data sources for computational biology, workshops/instruction on use of various bioinformatics tools, critical review of current research studies and computational methods, preparation for success in the PhD program and career development. Faculty members of the graduate program in computational biology and scientists from other institutions will participate. Topics will vary each semester.

Doctoral Seminar in Computational Biology: [Read More](#) [+]

### Rules & Requirements

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate

**Grading:** Letter grade.

**Instructors:** Moorjani, Rokhsar

**Also listed as:** CMPBIO C293

Doctoral Seminar in Computational Biology: [Read Less](#) [-]

## MCELLBI 375 Pedagogy for MCB Graduate Student Instructors 2 Units

Terms offered: Prior to 2007

This course introduces new graduate student instructors to effective teaching methods that they can use in their MCB courses. Through readings, discussions and demonstrations, students will learn how to engage and motivate students, facilitate active participation, plan a class period, and write exam or practice problems. Emphasis will be placed on science education literature and proven practical techniques. We will also provide support and solutions for dealing with difficult situations that may come up during the semester.

Pedagogy for MCB Graduate Student Instructors: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Appointment as graduate student instructor or consent of instructor

### Hours & Format

**Fall and/or spring:** 10 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Professional course for teachers or prospective teachers

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructors:** Ball, Beatty, Barnes

Pedagogy for MCB Graduate Student Instructors: [Read Less](#) [-]

## MCELLBI 380 Teaching of Molecular and Cell Biology 1 - 2 Units

Terms offered: Spring 2016, Fall 2015, Spring 2015

Teaching laboratories and/or discussions for Molecular and Cell Biology courses: analysis of specific format and problems. Two units of credit for those with 50% teaching appointment; one unit of credit for those with 25% teaching appointment.

Teaching of Molecular and Cell Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Appointment as graduate student instructor or consent of instructor

**Repeat rules:** Course may be repeated for credit up to a total of 4 units.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0-1 hours of seminar per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Professional course for teachers or prospective teachers

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Teaching of Molecular and Cell Biology: Read Less [-]

## MCELLBI 481B Instrumentation in Molecular and Cell Biology: Transmission Electron Microscopy 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Individualized laboratory instruction.

Instrumentation in Molecular and Cell Biology: Transmission Electron

Microscopy: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing; consent of instructor and sponsorship of a faculty member

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of independent study per week

### Summer:

6 weeks - 2.5-10 hours of independent study per week

8 weeks - 2-7.5 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Other professional

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructors:** Dernburg, Karpen

Instrumentation in Molecular and Cell Biology: Transmission Electron Microscopy: Read Less [-]

## MCELLBI 481C Instrumentation in Molecular and Cell Biology: Scanning Electron Microscopy 1 - 4 Units

Terms offered: Fall 2021, Spring 2021, Fall 2020

Individualized laboratory instruction.

Instrumentation in Molecular and Cell Biology: Scanning Electron

Microscopy: Read More [+]

### Rules & Requirements

**Prerequisites:** Graduate standing; consent of instructor and sponsorship of a faculty member

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of independent study per week

### Summer:

6 weeks - 2.5-10 hours of independent study per week

8 weeks - 2-7.5 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Other professional

**Grading:** Offered for satisfactory/unsatisfactory grade only.

**Instructors:** Dernburg, Karpen

Instrumentation in Molecular and Cell Biology: Scanning Electron Microscopy: Read Less [-]

## MCELLBI 601 Individual Study for Master's Students 1 - 8 Units

Terms offered: Fall 2006, Spring 2005, Spring 2001

Individual study for the comprehensive or language examinations in consultation with the field adviser.

Individual Study for Master's Students: Read More [+]

### Rules & Requirements

**Credit Restrictions:** Course does not satisfy unit or residence requirements for master's degree.

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-8 hours of independent study per week

**Summer:** 8 weeks - 1.5-15 hours of independent study per week

### Additional Details

**Subject/Course Level:** Molecular and Cell Biology/Graduate examination preparation

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Individual Study for Master's Students: Read Less [-]

## **MCELLBI 602 Individual Study for Doctoral Students 1 - 8 Units**

Terms offered: Spring 2006, Spring 2005, Fall 2004

Individual study in consultation with the major field adviser. Intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D.

Individual Study for Doctoral Students: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Restricted to Ph.D. candidates

**Credit Restrictions:** Course does not satisfy unit or residence requirements for doctoral degree.

**Repeat rules:** Course may be repeated for credit without restriction.

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

#### **Summer:**

6 weeks - 1-8 hours of independent study per week

8 weeks - 1-8 hours of independent study per week

### **Additional Details**

**Subject/Course Level:** Molecular and Cell Biology/Graduate examination preparation

**Grading:** Offered for satisfactory/unsatisfactory grade only.

Individual Study for Doctoral Students: [Read Less](#) [-]