

2021-2022 MCB Area of Interest Course Information

Cell Signaling & Cell/Environment Interactions

Please check the University of Washington Time Schedule for the most updated course information.

FOUNDATIONAL COURSES

Foundational Course One:

Course Number: CONJ 531

Course Title: Signaling Mechanisms in Excitable Cells

Instructor (s): Zagotta, Asbury

Location (e.g., UW, FH, SLU): UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-5

Attributes (e.g., graded, lecture-based): Lecture-based with weekly assignments.

Sub Area (if applicable):

Synopsis: Mechanisms of cellular signaling, particularly in nerve and muscle. Electrical, chemical, and mechanical signaling in the cell that lead to processes such as electrical excitability, action potentials, and muscle contraction.

Foundational Course Two:

Course Number: CONJ 532

Course Title: Signal Transduction: from the cell membrane to the nucleus

Instructor (s): Scott

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Winter, weeks 6-10

Attributes: Lecture and Literature Review

Sub Area (if applicable):

Synopsis: Intracellular signaling pathways leading from cell membrane receptors to nucleus. Pathways activated by seven transmembrane receptors and G-proteins, insulin/PI3 kinase, nitric oxide and WNTs and mechanisms of signal termination. Cytokine/Jak/Stat signaling and role of subcellular localization in signal transduction.

ELECTIVE COURSES

Note: Signaling occurs in all cells. Because the field of cell signaling is relevant to all aspects of cell and molecular biology, students choosing this area of interest will usually find their work overlaps with at least one of the other areas of interest. Therefore, we advise students who choose this area to identify a secondary (minor) area of interest and include electives from that area in their course plans.

Elective Course One:

Course Number: CONJ 524

Course Title: Structural Basis of Signal Transduction

Instructor (s): TBA

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Winter, weeks 6-10

Attributes:

Sub Area (if applicable):

Synopsis: There are three learning objectives. (1) By the end of the course, students are expected to know the common structural features and signaling/regulatory principles of most important signaling protein families, including kinases, phosphatases, ubiquitin ligases, G-proteins and GPCRs. (2) Through structural analysis, students are expected to learn ways to design approaches to specifically manipulate or control these molecular mechanisms. (3) Through homework and discussion, students are required to be able to download PDB files, analyze the molecular structure (using programs such as Pymol), and obtain desired structure-function relationship information.

Elective Course Two:

Course Number: PHCOL 531

Course Title: Genetic Analysis of Signaling Systems

Instructor(s): TBA

Location: UW

Credits: 3

Quarter, Weeks, and Frequency course is offered: Spring, odd years, weeks 1-10, *will be offered in Spring 2023*

Attributes: Lecture-based with literature review

Sub Area (if applicable):

Synopsis: Introduction to classic model organisms including plants, yeast, slime mold, flies, worms, fish, mice, and humans and a discussion of their use in current signal transduction research.

GENERAL METHODS/PROFESSIONAL DEVELOPMENT (GM/PD) COURSES

GM/PD Course One:

Course Number: UCONJ 510

Course Title: Introductory Laboratory Based Biostatistics

Instructor (s): Lloyd Mancl

Location: UW

Credits: 2.0

Quarter, Weeks, and Frequency course is offered: Summer

Attributes: Lecture-based with assignments

Sub Area (if applicable):

Synopsis: Introduces methods of data description and statistical inference for experiments. Covers principles of design and analysis of experiments; descriptive statistics; comparison of group means and proportions; linear regression; and correlation. Emphasizes examples from laboratory-based biomedical sciences, and provides demonstrations using standard statistical programs.

GMPD Course Two:

Course Number: MCB 533

Course Title: How to give a scientific seminar

Instructor(s): Jihong Bai

Location: FH

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-5, *will be offered in 2023*

Attributes: Career development and methods

Sub Area (if applicable):

Synopsis: A crucial part of a scientific career is the ability to effectively deliver a research seminar. This course will focus on all aspects of giving a seminar and teach students how to introduce the research topic, how to make clear and effective slides, and how to explain methods and data in a clear manner. Students will prepare their own research seminar throughout the course. Each week they will practice a part of it and receive feedback from other students and the instructors. By the end of the course, students will have an entire seminar about their thesis project prepared. The course will also give examples of good and bad seminars and help students learn how to communicate with non-scientists about their research.

GM/PD Course Three:

Course Number: MCB 543

Course Title: Logic Constructs and Methodologies of Biological Research

Instructor(s): Sandra Bajjalieh

Location: UW

Credits: 3.0

Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-10, *will be offered in 2022*

Attributes: Career development and methods

Sub Area (if applicable):

Synopsis: This course surveys the logic and methods of scientific practice from historical, practical, and sociological points of view. Topics covered include how the philosophy of science influences experimental approaches, how the demarcation between science and pseudoscience has evolved, how common cognitive biases lead to errors in judgement and interpretation, and how sociological factors impact scientific progress.

GM/PD Course Four:

Course Number: MCB 560

Course Title: MCB Biotechnology Externship

Instructor(s): Nina Salama

Location: TBA

Credits: 2.0

Quarter, Weeks, and Frequency course is offered: Summer, weeks 1-10

Attributes: Career development and methods

Sub Area (if applicable):

Synopsis: This externship program provides MCB students with the opportunity to gain firsthand research experience in biotechnology companies in the Puget Sound area. Applications are available in the early spring and reviewed by the Externship Program Director. Applications are submitted to participating companies to find a suitable match. This externship is only available during the summer between Year 1 and Year 2 to students who have completed 3 rotations and identified a dissertation laboratory. Students are supported by MCB for the summer quarter.