

## 2023-2024 MCB Area of Interest Course Information

# Gene Expression, Cell Cycle & Chromosome Biology

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

### FOUNDATIONAL COURSES

#### Foundational Course One:

**Course Number:** CONJ 537

**Course Title:** Mechanisms of transcriptional regulation

**Instructor (s):** Steve Hahn, Toshio Tsukiyama

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

**Credits:** 1.5

**Quarter, Weeks, and Frequency course is offered:** Autumn, weeks 6-10, offered even-numbered years, *will be offered in Autumn 2024.*

**Attributes (e.g., graded, lecture-based):** Lecture-based

**Sub Area (if applicable):**

**Synopsis:** A five-week graduate survey course concentrating on biochemical mechanisms of gene transcription. The course will cover a broad range of transcriptional regulation including: Mechanisms of transcriptional initiation; Regulation of transcription by chromatin; Transcriptional regulation, development and diseases in mammals.

**Note:** Alternatively, similar course material is covered in GENOME 551 – Principles of Gene Regulation (Winter, weeks 6-10, *will be offered in Winter 2024*, 1.5 credits). Enrollment priority is given to Genome Sciences graduate students.

### ELECTIVE COURSES

#### Elective Course One:

**Course Number:** CONJ 532

**Course Title:** Signal Transduction from The Cell Membrane to The Nucleus

**Instructor (s):** Shao-En Ong

**Location:** UW

**Credits:** 2.0

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

**Attributes:** Lecture

**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, MAPKs, and WNTs and mechanisms of signal termination. Cytokine/Jak/Stat signaling and role of subcellular localization in signal transduction.

#### Elective Course Two:

**Course Number:** CONJ 544

**Course Title:** Protein Structure, Modification, and Regulation

**Instructor (s):** Barry Stoddard

**Location:** FH

**Credits:** 1.5

**Quarter, Weeks, and Frequency course is offered:** Winter, weeks 1-5, offered odd-numbered years, *will be offered in Winter 2025*

**Attributes:**

**Sub Area (if applicable):**

**Synopsis:** Overview of general principles of protein structure, including forces that contribute to folding and stabilization, followed by an extended coverage of the means by which protein structure and function are modified and regulated. Examples from recent developments in protein folding, processing, and allosteric regulation. Prerequisite: introductory biochemistry and cell biology.

Elective Course Three:

**Course Number:** MCB 522

**Course Title:** The Developmental Basis of Human Disease

**Instructor (s):** Cecilia Moens

**Location:** FH

**Credits:** 3

**Quarter, Weeks, and Frequency course is offered:** Winter, weeks 1-10, *will be offered in Winter 2024*

**Attributes:**

**Sub Area (if applicable):**

**Synopsis:** Uses recent discoveries in human genetics to guide student learning about animal development. Explores the normal developmental function of genes that have been identified as causal in human developmental disorders such as skeletal dysmorphologies, ciliopathies, autism, and cancer.

Elective Course Four:

**Course Number:** MCB 539

**Course Title:** Biological Basis of Neoplasia

**Instructor (s):** David MacPherson, Bob Eisenman

**Location:** FH

**Credits:** 3

**Quarter, Weeks, and Frequency course is offered:** Spring, weeks 1-10, *will be offered in Spring 2024*

**Attributes:** Lecture and Literature Review

**Sub Area (if applicable):**

**Synopsis:** Introduces the major themes in research in the biology of neoplastic change. Covers principle molecular mechanisms responsible for tumor initiation and progression, with a specific emphasis on intracellular signaling, DNA repair, cell cycle checkpoints, and loss of normal tissue homeostasis. The latest state of the art research in Cancer Biology will be presented by invited scientists, experts in their relevant field. The discussion meetings will concentrate on selected major papers in cancer biology and be presented and discussed by the students with help and guidance of the instructors.